# DUN'S REVIEW and Modern Industry

A Dun & Bradstreet PUBLICATION

FEBRUARY, 1955
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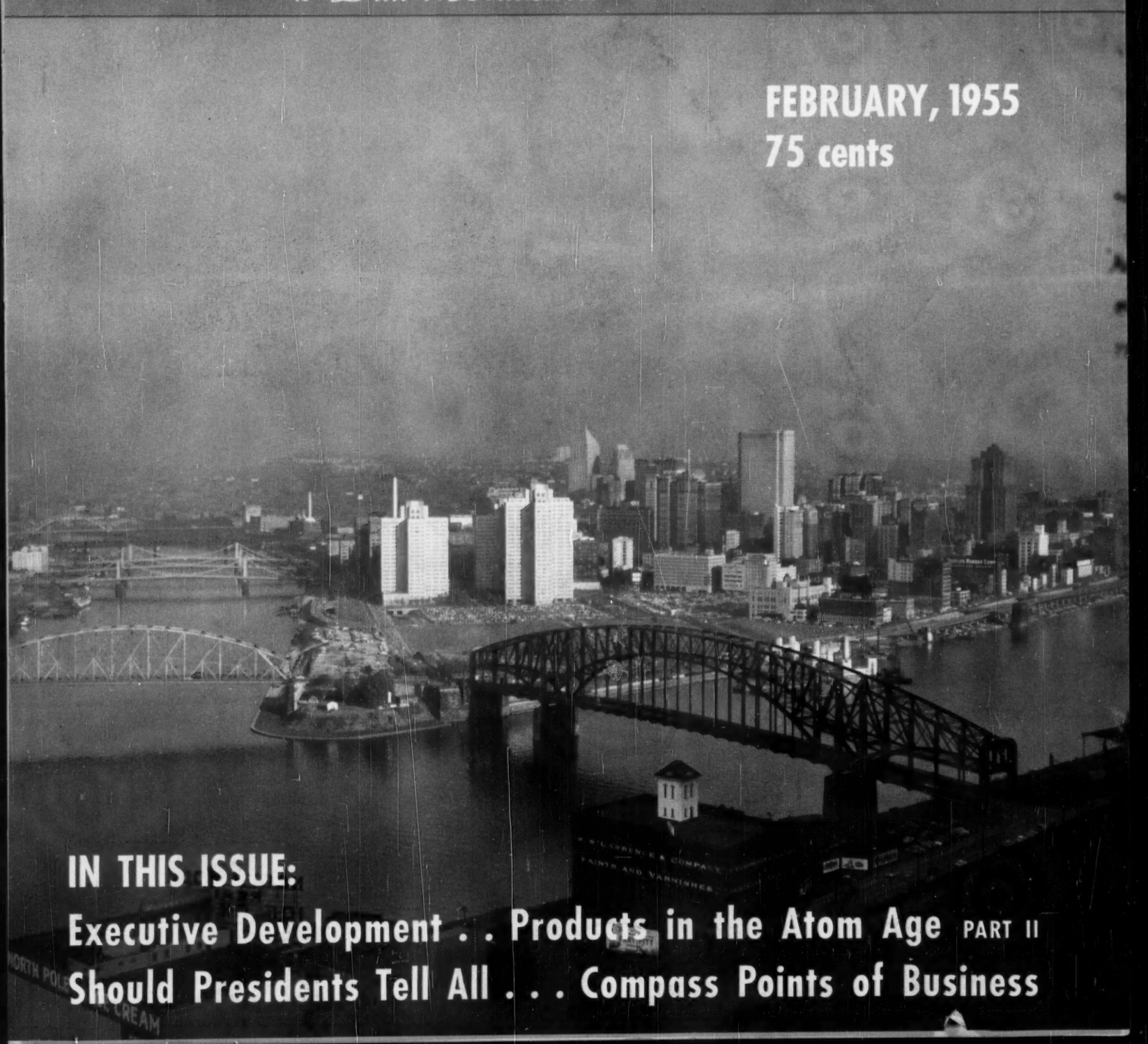

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Should Presidents Tell All . . . Compass Points of Business

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# DUN'S REVIEW and Modern Industry


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J. Harold Kolseth
*Executive Vice-President, Devoe & Raynolds Company, Inc.*

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*Professor of Industrial Administration*
*Carnegie Institute of Technology*

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——, *see especially:*

*Our Cover*

The Golden Triangle of Pittsburgh, at the junction of the Allegheny and Monongahela Rivers, begins to take on a new aspect as new buildings rise and the site of Fort Pitt is transformed into a 36-acre park.

COLOR PHOTOGRAPH BY LOUIS C. WILLIAMS


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Months in research, these hard-hitting articles will probe into your company's third biggest cost and show that lack of management control and coordination wastes the equivalent of millions of dollars in sales. Checkcharts, surveys, case studies, and sharp analysis will profile the problem, provide the background for management action.

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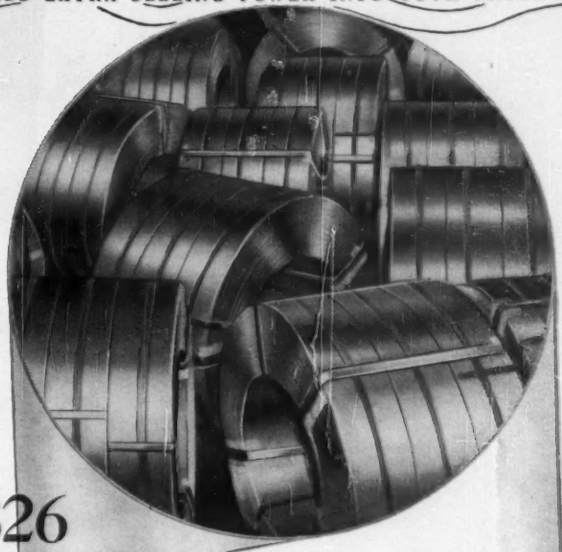

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*A forge was lighted*
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For your products, select steel by a specialist . . . where custom-production and exact quality control are standard practice. A wholly integrated operation . . . undivided mine-to-mill-to-market responsibility . . . modern, up-to-date continuous mills and more than a century and a quarter of meeting the most rigid metallurgical demands—these are your assurances of the finest quality steel it is possible to produce.

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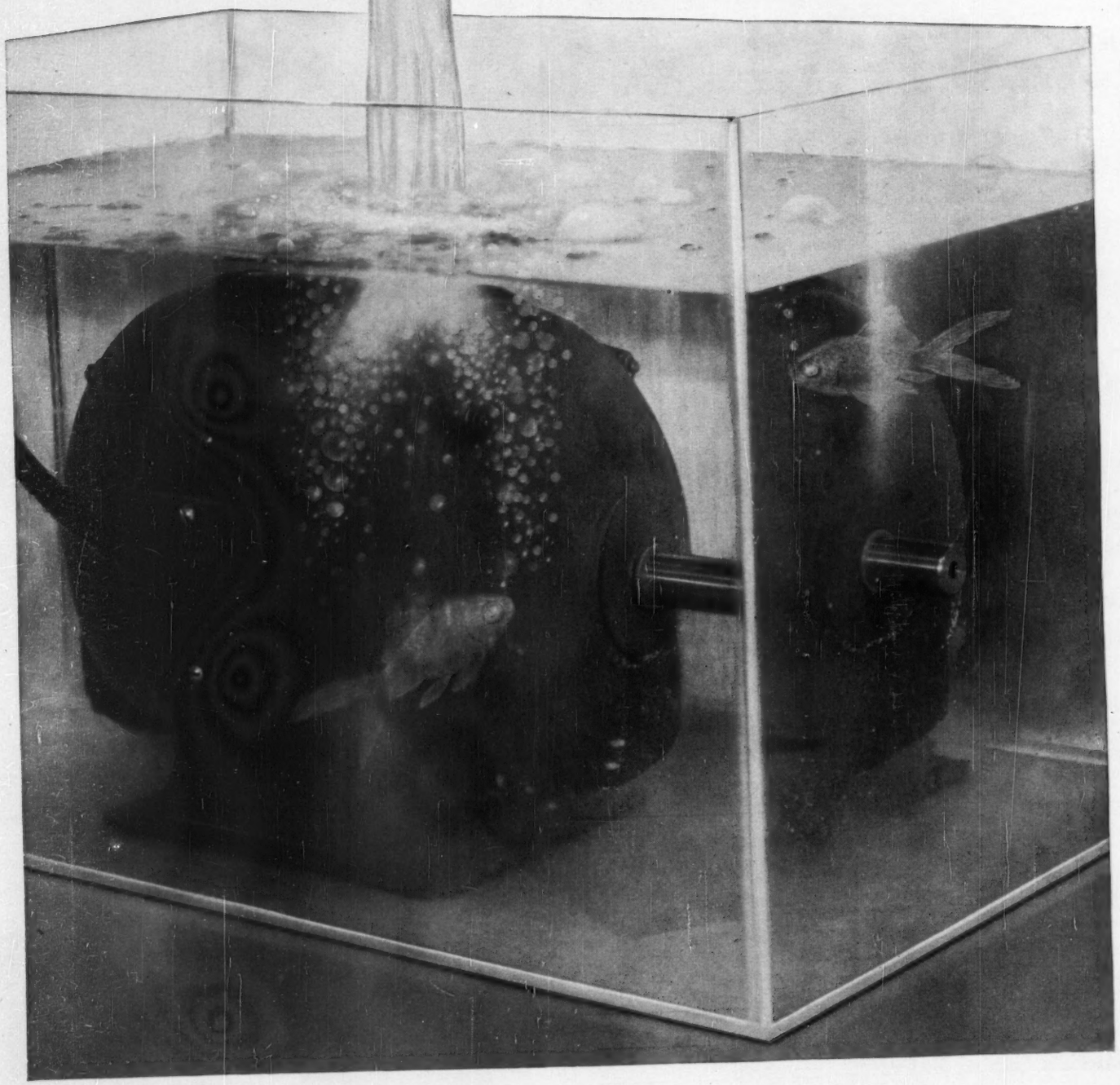
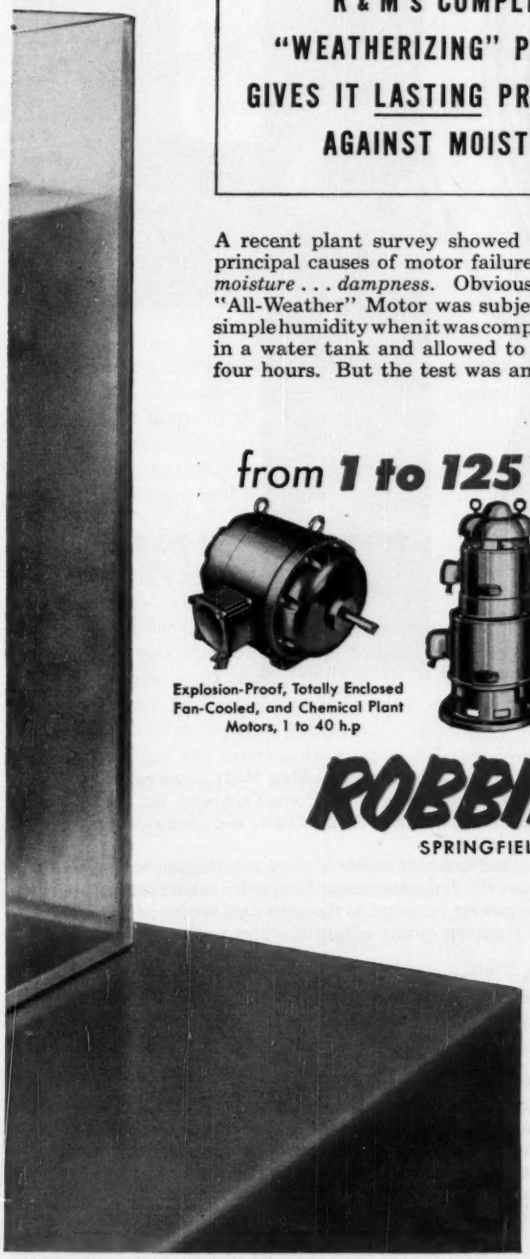
***but this R & M motor***



# COVERED WITH WATER

# *is still going strong!*



**R & M's COMPLETE "WEATHERIZING" PROCESS GIVES IT LASTING PROTECTION AGAINST MOISTURE**

A recent plant survey showed that one of the principal causes of motor failure is *humidity . . . moisture . . . dampness.* Obviously, this R&M "All-Weather" Motor was subject to more than simple humidity when it was completely "dunked" in a water tank and allowed to run for twenty-four hours. But the test was an *accelerated* version of what happens to motors over a period of months or years.

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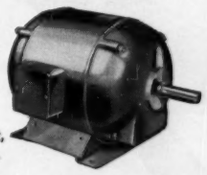
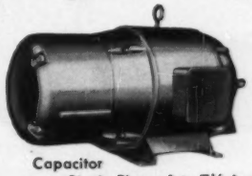


Direct Current, 1 to 7½ h.p.



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**Executive Offices: Alcoa Building, Pittsburgh 19, Pa.**

*For more than 40 years, Paul Wooton has reported the thoughts of Washington officials. Chairman of the Executive Committee of the Society of Business Magazine Editors, he has also served as president of the White House Correspondents' Association, the National Press Club, and the Overseas Writers.*

**AN ERA OF GOOD FEELING** has prevailed thus far in the present session of Congress. Members are not worrying much because they feel little of major importance will be done. Changes might be for the worse. The elections are out of the way. Sharp disagreements are confined to peripheral matters that are of no general importance. No protracted debate on foreign trade policy seems probable. Controversy over peril points and customs procedure will be behind closed doors of the Ways and Means Committee. Agreement on Taft-Hartley amendments is doomed to fail. The President's tax proposals will be accepted.

As long as mergers result in lower costs to consumers it will be difficult to justify punitive legislation. Labor unions prefer to deal with large companies. Small companies are doing far better than at any other time. Small business has a big stake in prosperity. Fair trade laws have given a big boost to private brands. Increasing the minimum wage to 90 cents is not too important economically, particularly since there is evidence that it does not affect differentials importantly. The stock market worries Congress more than it does the business man. The decision to shorten up next year's political campaign means that disturbance to business will be for a shorter period. The national committees finally have recognized that airplanes, television, and radio have cut down the necessary campaigning time.

★ Politicians know that votes are influenced by recent favors. For that reason the real push to increase income tax exemption from $600 to $700 will be made in 1956. With the budget unbalanced, the President's recommendation for the continuation of corporation and income taxes at present rates will be accepted. Labor union demand for restoration of the excess profits tax is political drum-beating. The anticipated recommendation for a thorough-going overhaul of excise taxes was not forthcoming. The Administration fully expects to recommend tax reductions a year hence with chief reliance on the country's economic growth.

★ Behind the purely partisan comments on the President's State of the Union message is the feeling among legislators that it conforms to the "moderately progressive" policy which the Chief Executive publicly espoused. It is calculated to widen the differences with right wing Republicans, some believe. To many members of the House and Senate the message indicates that balancing the budget is not now the number one objective, but the deficit will be held at a point that does not upset stability. The determination indicated of keeping the country strong has allayed some misgivings. Lawmakers see nothing in the message that would indicate any departure from the policy of contributing in every way possible to the military and political stability of free countries.

★ Consideration of the growth of monopoly power will occupy much of the time of a judiciary subcommittee at this session of Congress, says Chairman Emanuel Celler. Time is essential, he explains, because the subject matter is broad and complex and requires thorough examination. He emphasizes that he does not expect to ask for an appropriation of $1 million as was indicated earlier in this column. Most of those who are in a position to make valuable contributions to such an investigation are willing to appear voluntarily. Experience shows that few subpoenas have to be issued.

The research work which is so necessary to such an investigation will be done by a small staff supplemented by information that can be furnished by various Government agencies and the experts at the Library of Congress. Representative Celler is not opposed to bigness *per se*. "It is wonderful to have the power of a giant," he says. "It is the abuse of power that concerns me. We need bigness. We have big Government and concomitantly we must have big business and big unions."

★ Washington notes with approval the increasing tendency among corporations to provide scholarships and to make grants to educational institutions. Any step which improves the quality of manpower is welcomed. Demands of defense and of an expanding economy call for more engineers, scientists, and technicians.

★ Prosperity as well as depression seems to generate a fear psychosis. It is just as foolish, some officials say, to try to deny that the country now is in an upswing as it is to refuse to recognize the trend when the business cycle turns downward. The prosperity the country is enjoying should not frighten anyone, they say. A highly favorable state of economy has been attained—one for which the leaders long have been struggling. They wonder if it is fully appreciated.

Business during the Christmas season reached an unexpected high. Retailers racked up a new record. The growth potential of the country has not been scratched. The President foresees a gross national product of $500 billion. Labor leaders say that estimate is too low. A prominent member of the Ways and Means Committee says that when present differences are resolved the rest of the world will share with the United States a prosperity that "defies description." Difficulty is experienced in finding weak spots. Those pessimistically inclined admit that the situation at the moment looks good, but they foresee unfavorable developments in the future. There have been many instances in the past year which demonstrate the inexactness of prognostication.

With all the ground there is on which to base optimism there are still problems. The Federal Reserve raised a warning finger when buying on margin began to gather momentum. The "Fed," however, recognizes that there could be wild speculation even were no credit available. The feeling is growing, as this is written, that easy money has played its role. There is no intention of allowing it to become our way of life. The harvest would be the whirlwind. The fact that there has been some deterioration in the quality of credit, particularly in real estate, is not being overlooked. Farmers are not happy, but the demand for their products is rising and will be helped when changes in import restrictions permit foreigners to earn more dollars.

Paul Wooton

WASHINGTON, D. C.

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The installation of a new Danly Press in any press line can produce exceptional cost-cutting results. This fact has been proved in the production records of leading stamping shops throughout the country. But when you count pieces at the end of a shift, it's the efficiency of the *whole* line that really counts. That's why production chiefs are specifying *complete lines* of new Danly Presses.

Running together as an integrated production unit, Danly Presses turn out more finished stampings per shift—at lower cost and with fewer line shutdowns. This is the kind of performance *you* can expect from Danly Presses. The reasons for it are many: Danly's heavier, more rugged construction gives the reserve strength necessary to meet the demands of continuous peak-load line operation. Automatic oil lubrication saves hundreds of hours of press maintenance. Exclusive electrical and pneumatic control devices permit convenient automation adaptability and increased safety. Danly's cooler running clutch and brake wear longer, need less replacement. From blanking to finished stamping, every Danly Press delivers more work per shift. Write to Danly today . . . experienced press engineers will be glad to discuss your specific stamping problems.

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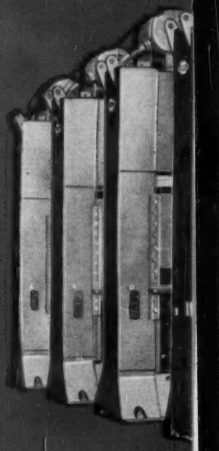
MECHANICAL PRESSES . . . 50 TO 3000-TONS



It costs less to run a DANLY PRESS line!

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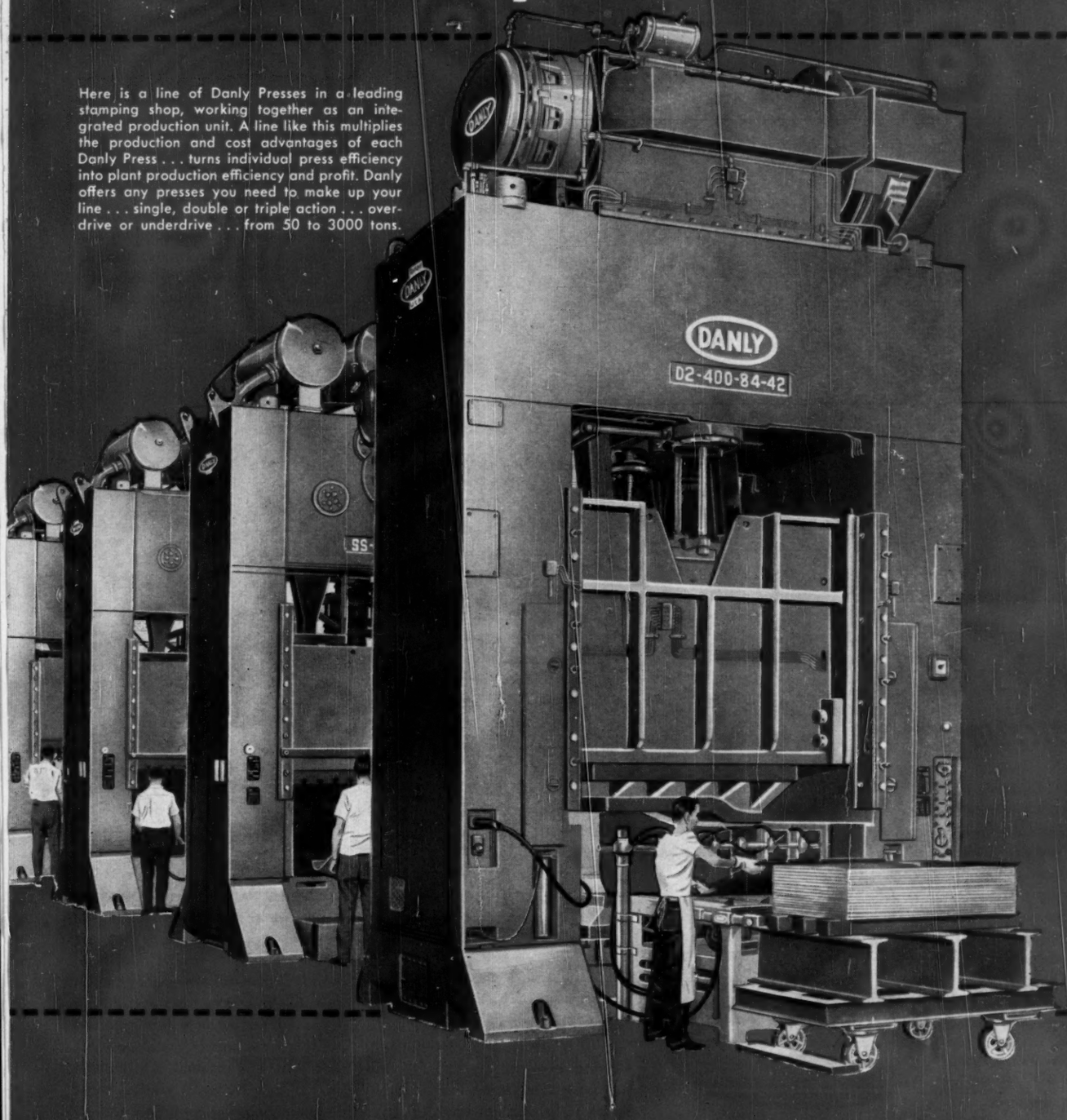
Here is a line of Danly Presses in a leading stamping shop, working together as an integrated production unit. A line like this multiplies the production and cost advantages of each Danly Press . . . turns individual press efficiency into plant production efficiency and profit. Danly offers any presses you need to make up your line . . . single, double or triple action . . . overdrive or underdrive . . . from 50 to 3000 tons.

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# QUICK WAY TO CUT CARTON COSTS

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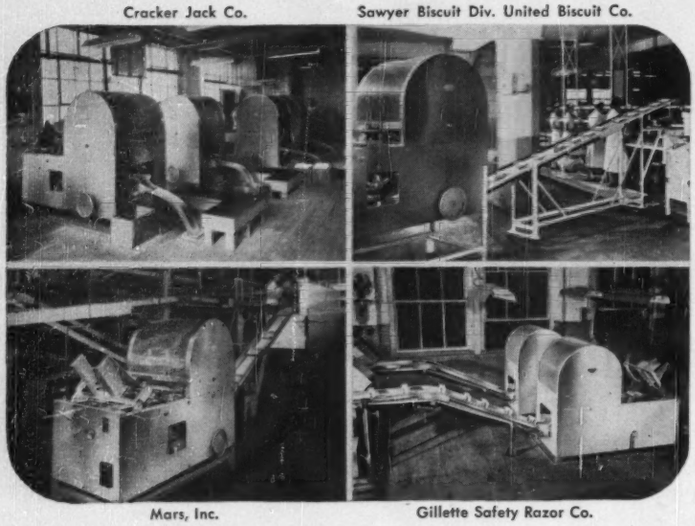

Mars, Inc. Gillette Safety Razor Co.

*Make 'em in your own plant*

Manufacturers in many fields are installing our Model PA carton former because of the substantial savings it makes. Often pays for itself in *less than a year through savings on material costs alone.*

With this machine, you simply buy die-cut cardboard blanks—far cheaper than finished or hand-set-up cartons. The machine forms the blanks and glues them at speeds up to 100 a minute. Requires so little supervision that in some plants one person takes care of several PA machines. It is adjustable for different sizes and delivers the cartons right-side-up so they can be conveyed automatically to filling stations.

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# VOICE OF INDUSTRY

***Five reasons for expanding foreign trade and investment; why the path of foreign policy is rough; America's needs in future years.***

## *Foreign trade for our betterment*

*"The seller's market . . . has already started to fade . . ."*

**HOBART C. RAMSEY**

*President, Worthington Corporation, before National Foreign Trade Council, 41st Convention in New York.*

I believe that our foreign trade and our foreign investments should be much larger than they are. An expanded foreign trade would undoubtedly be of substantial help to our foreign policy and would strengthen the economies of our friends and allies abroad. I believe that the importance of these considerations is generally accepted today. In addition, foreign trade is important to us strictly from the viewpoint of American business.

While I do not overlook the difficulties which may be encountered I can think of at least five sound business reasons for expanding our foreign trade and our foreign investments.

First, there is business to be had abroad and American business men ought to be getting their share.

Second, foreign trade can yield a very good return on investment. This leads to my third point, which is that pressure is rising for new outlets for investment.

Fourth, overseas operations provide an excellent training ground for young Americans. If the United States is to play its most effective role in world commerce, it needs to draw upon the talents of more and more men and women who have worked abroad.

A fifth and final reason is that we face increasingly stiff competition abroad. Even to keep our present share of trade, we have to hustle. The seller's market for U. S. products has already started to fade as England, Germany, Holland, Belgium, and other countries intensify their efforts to get new customers.

## *Citizen's rôle in foreign policy*

*"Our foreign policy makers do not have it . . . easy."*

**WARREN LEE PIERSON**

*Chairman of the Board, Trans World Airlines, Inc., Chairman, U. S. Council, International Chamber of Commerce, before Executives' Club, Chicago.*

In no field is a democracy under an apparent disadvantage with a totalitarian state as in the conduct of its foreign relations. The Kremlin leaders have only to decide what is best for them. That the result may adversely affect most of their citizens is of no consequence; I doubt that it is even considered.

Our foreign policy makers do not have it that easy. Daily they are called upon to make decisions which *if* they did not impinge upon private American interests; and *if* they did not involve our relations with other countries, could be easily and promptly reached. The trouble is that they *do* usually affect some segment or our population and all too frequently *do* have repercussions abroad.

We are inclined to forget that economic actions taken by our Government ought to be co-ordinated.

*"It's like waxing your floors with a film of plastic"*

NEW
SUPER
WESTWAX

contains

MIRITE®
PLASTIC
EMULSION

WHEN you apply new SUPER WESTWAX it's just like laying down a protective sheet of tough, transparent plastic on your floors.

With NEW SUPER WESTWAX you get
— brilliant gloss
— extra durability
— freedom from discoloration
— easier maintenance

Why? Because this heavy-duty formulation contains — West's crystal clear Plastic Emulsion, MIRITE®
*and*
prime #1 yellow Carnauba Wax.

IT combines all the features of the finest floor protection in a single wax:
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— resists scuffing from traffic
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And SUPER WESTWAX is slip resistant — meets Underwriters' Laboratories requirements for floor treatment materials.

OLDEST AND LARGEST COMPANY OF ITS KIND IN THE WORLD

LET a West floor expert demonstrate SUPER WESTWAX on your own floor — show you how easy it is to use. No obligation, of course. Just send the coupon.

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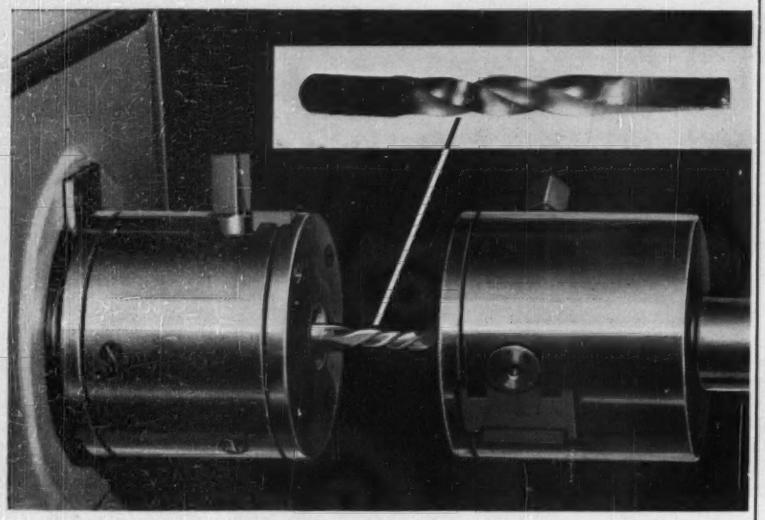
Name_____

Position_____

*(Tear out this coupon and mail it with your letterhead)*

## IN POWDER METALLURGY...IT'S AMPLEX



New STEEL OILITE'S unusual ductility is demonstrated in this photo of a typical torsion test. This material was developed by Chrysler for applications requiring extreme ruggedness.

## *NEW* Ductile STEEL OILITE® Opens Up New Uses for Powder Metals

STEEL OILITE is a new and revolutionary Chrysler developed die-pressed powder metal with ductility and strength in the range of low carbon steel (elongation values up to 15%; tensile strength from 35,000 to 120,000 PSI).

Its unique physical properties make considerable savings possible for countless new applications. One customer reported savings of 96%. Eliminates most machining operations.

STEEL OILITE may be hardened, machined and staked using conventional methods. Developed by Chrysler-Amplex engineers, STEEL OILITE has been production and field tested for over 18 months.

The engineering facilities of Amplex and Chrysler, unmatched in the powder metal industry, are ready to help you. Call or write today for STEEL OILITE information.

***Chrysler-Amplex Products***

**OILITE Bearings**
**Finished Machine Parts**
**Permanent Metal Filters**

Write today for new STEEL OILITE Bulletin STM-54. It's yours for the asking.

*Only Chrysler makes OILITE*

OILITE **CHRYSLER CORPORATION**
**AMPLEX DIVISION**

**Dept. W-Z** **Detroit 31, Mich.**


We must see to it that they are consistent at all times with our over-all foreign policy. But the burden of consistency does not stop with the Government; it extends to each and every one of our citizens. We will not have reached our goal until each of us, either through a personal sense of responsibility or because of pressures exerted by the community in which we live, are willing to serve the *national* rather than our *individual* interest. . . .

### *Needed: More brains and better education*

*"Brains will be in much greater demand than brawn . . ."*

RALPH J. CORDINER

*President, General Electric Company, before 59th Annual Congress of American Industry, NAM, New York.*

Our greatest challenge for long-range planning is the development of men.

In view of the statistics so often recited about our rapidly growing population, it may seem a paradox to suggest that our greatest shortage may be people. But it is not with mere numbers of people that we are concerned. The important reason for concern is the level of training and education which will be required in the industrial world of the future. Brains will be in much greater demand than brawn as motors and electronic controls take over more and more of the back-breaking jobs. The typical manufacturing position will be in a far pleasanter environment than most today, and the assignment will be more stimulating. But to make this promise a reality, we will need more people with managerial ability, more specialists of every kind, more technicians, and much better educated employees at every level.

Our need for more engineers is urgent, but the problem is not confined to a shortage of technically trained people. Today we face a shortage of education at every level of schooling. . . . But great as the problem is, the solution is within our reach if we have the will and wisdom to finance it.


**plant-location news**

## Need facts on buildings or sites?

Here's some plain talk on a rather tricky subject—industrial real estate. Our Industrial Location Service doesn't sell property, but we can help you with many of the problems involved in locating the right plant, or plant site, for your company. What we do is supply confidential data to suit your needs on available sites or buildings anywhere in New York State. This comprehensive information is free of charge and, even more important, free of "boosterism"!

We never try to unload real estate just because it's available. Businessmen simply don't go for that kind of promotion. Besides, the aim of New York State's ILS is to find only the *best* locations for industry. We want companies who'll stay here for years to come. They'll do that only if the location *is* the best. That's why we supply unbiased data right from the beginning.

**We aim to please: with facts**

That's the kind of thinking behind the ILS information service. The way we look at it, real property is only one of many considerations. ILS experts never recommend a site without sifting and analyzing all location factors in the light of your particular requirements. And they'll never withhold unfavorable information.

**Find what you want here**

Let's get down to cases, and see what kind of detailed information ILS offers.

For suitable buildings, we'll give information on price and financing, describe the type and condition of the structure and explain the heating or cooling systems. You'll also learn about electric installations, sprinklers, floor-load capacities, and facilities for handling sewage and other waste. Water sources, rail sidings, loading docks—any detail you wish, plus photos and plans, can be supplied in these reports.

If no suitable building exists, we'll help you arrange to have one built to your specifications—and we'll help you secure financing at an annual cost you can afford.

You'll like the way we collect this information. It's put together without divulging your identity, so there's never the danger of prices being jacked up before you're ready to make a final choice.

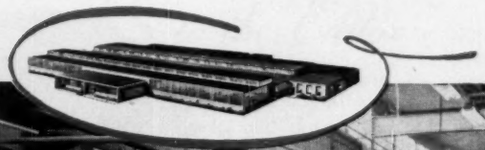
**Other free plant-site services**

Buildings or sites won't be your only concern when you're looking for a new plant location. But no matter what factors are involved, ILS can be of help. Free reports are available on transportation, markets, raw materials, labor, water, and local laws and regulations—to mention just a few.

Our booklet called "Industrial Location Services" shows how you can put this valuable plant-location data to work. To get your free copy, just drop me a card, care of the New York State Department of Commerce, Room 739, 112 State St., Albany 7, N. Y.

Ronald B. Peterson

*Director, Industrial Location Service*



**THIS IS ALLIED'S PLANT 3**

# Where PRECISION PARTS Are Produced To Your EXACT SPECIFICATIONS

Allied's Plant 3 in Hillsdale, Michigan, is specifically set up for volume production of precision hardened and ground parts. Here is over 76,000 square feet of floor space . . . the most modern type of machines and production equipment . . . and highly skilled personnel supervised by plant executives of long, practical experience.

It is a matter of record that when many of the country's largest and most prominent manufacturers require parts that must adhere rigidly to quality specifications, they rely on Allied to produce them. As an example, aircraft engine parts of many types are in regular production in this plant. Significantly, Allied is a preferred source for such parts . . . past performance having proved that here the most exacting specifications for close tolerances, fine surface finish and carefully controlled heat treatment will be met exactly.

In other industries where precision hardened and ground parts are required in substantial volume, Allied is also a primary supplier. To meet your present or future needs, Allied has the well-organized facilities and proven ability to produce them economically and promptly.

*This new brochure outlines fully the facilities and scope of operations at Allied's Plant 3. Write for your copy.*

ALLIED CORPORATION PRODUCTS — PRECISION • EXPERIENCE • DEPENDABILITY

## ALLIED PRODUCTS CORPORATION

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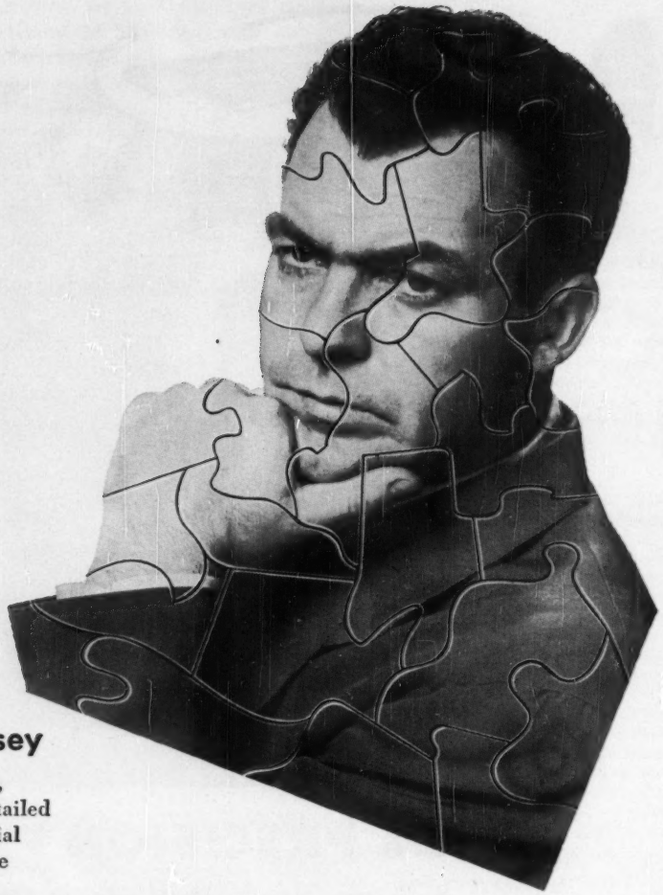
*Produced in* **ALLIED'S FIVE OTHER PLANTS** — SPECIAL COLD FORGED PARTS; STANDARD HEXAGON HEAD CAP SCREWS; SHEET METAL DIES PRODUCED IN IRON, ALLITE (ZINC ALLOY) AND PLASTIC; R-B INTERCHANGEABLE PUNCHES AND DIES; POWDERED METAL PARTS

# puzzled

## about a new industrial location?



# GPU *Site-Service*

**offers one central source of site information for nearly half of Pennsylvania and New Jersey**

One call or letter solves your problem. *Site-Service* forwards pictures, plans and specifications on selected sites and buildings. You receive detailed reports on water, labor, utilities and other services. A staff of industrial development men is available to do your leg work; to help you make local contacts. Take advantage of this free, confidential service. Let *Site-Service* supply the answers on the best sites in GPU Pennsylvania and New Jersey. It's an area made up of hundreds of small, uncongested communities within overnight shipping distance to one-third of the nation's population.

GPU ELECTRIC POWER COMPANIES

Metropolitan Edison Co.
Pennsylvania Electric Co.
New Jersey Power & Light Co.
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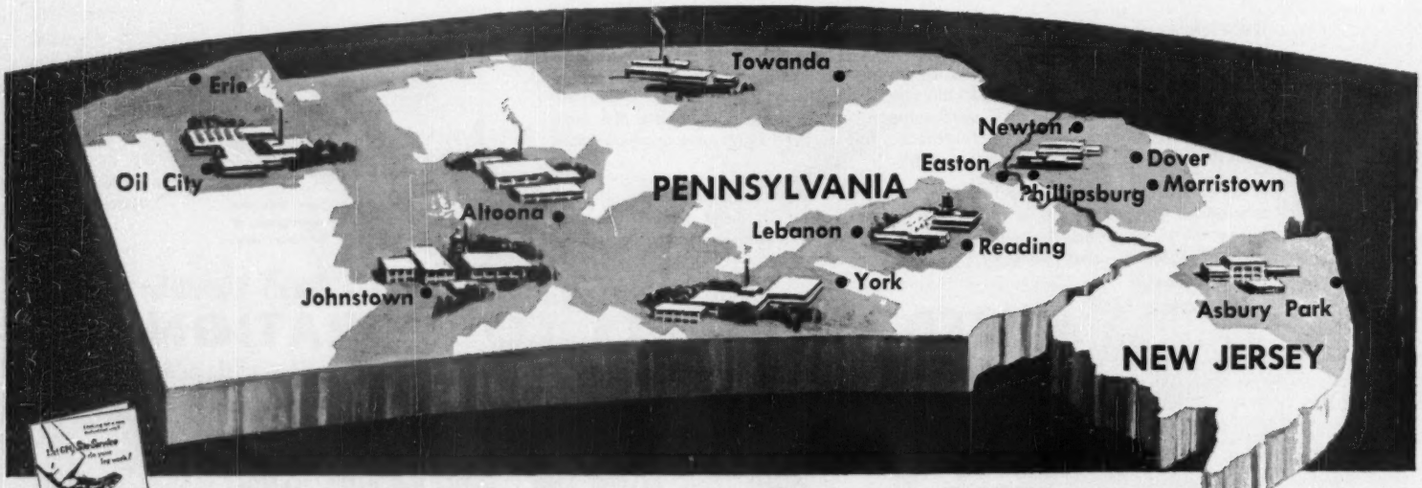


For free brochure and detailed map write SITE-SERVICE, Dept. DR-1

## GENERAL PUBLIC UTILITIES CORPORATION

AND SUBSIDIARY ELECTRIC POWER COMPANIES

**67 Broad Street, New York 4, N. Y. • Telephone WHitehall 3-5600**

# LETTERS *to the Editor*

PULLING POWER

New York, N.Y.

Dear Sir:

You are to be congratulated on the magnificent job you are doing with your film section in DUN'S REVIEW AND MODERN INDUSTRY. There is no doubt in my mind that your readers find information on training films of tremendous value to them.

My belief is further substantiated by the fact that more than 225 requests for our catalog (see December 1954, page 26) have been received as a direct response to the announcement which you ran. . . .

*Victor W. Eimicke*
Audio Visual Extension Service
The City College

Washington, D.C.

Dear Sir:

We were very pleased to read your September "Films for Management" section.

We have had a decided increase in correspondence on *It's Everybody's Business* as a result of this article, and during the past week we have received approximately 30 requests for more information on this film which are definitely a result of this article.

*Carl B. Foster*
Specialist, Visual Education
U. S. Chamber of Commerce

ON AND FOR TRAINING

Brooklyn, N.Y.

Dear Sir:

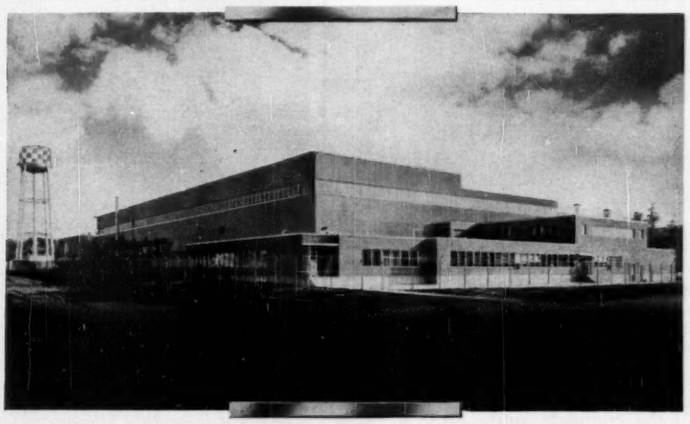
If possible, we would like to have 100 reprints of "The Need for Executive Versatility" (October 1954) for distribution to the senior class in the College of Business Administration. . . .

*Howard K. Rice*
Dean
Long Island University

Brooklyn, N.Y.

Dear Sir:

Your article in the November issue of DUN'S REVIEW AND MODERN INDUSTRY, entitled "NAF Trains

**Rockrite Products Division of Tube Reducing Corporation (Naval Industrial Reserve Aircraft Plant) Wallington, New Jersey . . . New plant houses special, extra-heavy, cold working, tube reducing machines to produce cylindrical, tapered or special bore tubing. Plant is a fully integrated unit with its own die shop, boiler plant, electric substation, offices, laboratory, cafeteria, and garage. Complete design by Lockwood Greene.**

**LOCKWOOD GREENE**
ENGINEERS - ARCHITECTS

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**OVER A CENTURY OF INDUSTRIAL PLANT DESIGN EXPERIENCE**
*Brochure available on request*

**TWO SUCCESSES...** *one familiar...one new*

**DUREZ PHENOLICS**
*make things* **BRIGHTER** *for buyer and seller*

In many products the self-insulation of Durez plastics earns them top rating among modern materials. For others, it's their heat resistance in combination with other wanted properties.

But for years, Mrs. America's work days have been brightened materially by the corrosion resistance of one group of Durez phenolics. Unaffected by mild acids and alkalies, these materials in molded agitators remain smooth-surfaced for years, protecting delicate fabrics and assuring efficient cleaning.

Now the same consumer benefit is being extended to dishwashers with an impeller that sends steaming sprays of super-heated water through the entire washing compartment. In both types of product, manufacturers obtain the efficiency of undulated or convoluted shapes with the economy of molding in one piece.

Pre-eminently the plastics of hard-working parts, yet widely used for their attractive appearance, Durez phenolics may make things brighter for your products...in production costs or sales appeal or both. Call freely on our 34 years of specialized experience for help. And let us send you "Plastics News."

Durez Plastics & Chemicals, Inc., 1902 Walck Road, North Tonawanda, N.Y.

*Export Agents:* Omni Products Corporation, 464 Fourth Avenue, New York 16, N. Y.

**MOLDING COMPOUNDS.** Structural, electrical, and chemical properties in many combinations.

**RESINS FOR INDUSTRY.** Bonding, casting, coating, laminating, impregnating, and shell molding.

## We Discovered

# Microfilm Alone Is Not Enough!

**That's why we are offering**

**FILMSORT®**

**UNITIZED MICROFILM EQUIPMENT and SUPPLIES to complement our complete microfilm service**

IF YOU ARE thinking of microfilming, we can offer you the most complete, modern service available . . . microfilm plus Filmsort . . . microfilm affording security and space savings—Filmsort the PLUS of practical usage.

We will take your records in their present form, reduce them to microfilm and return them to you housed in Filmsort Aperture or Jacket cards, designed for single frames or strip film, indexed and ready to file according to any system of your choice. The negative roll provides security—the Filmsort card containing a second copy provides a system of *active reference*, combining the means of locating with the actual file.

You may be using microfilm now, probably for security purposes only or for low reference files. If so, you are familiar with the advantages of space savings and security afforded by this medium. Filmsort enables you to apply these same advantages to your live, high reference records. You may require the Filmsort Aperture card for engineering drawings—or the Filmsort Vidifile Jacket for personnel records. Whatever the specific need, wherever records must be kept and *used*, microfilm *plus* Filmsort can provide the answer.

We would consider it a privilege to have one of our systems experts discuss your record problems with you. We are certain he will be able to show you how Filmsort can work for you.

**Our service centers or representatives are located in:**

Atlanta, Ga.
Cambridge, Mass.
Chicago, Ill.
Cincinnati, Ohio
Cleveland, Ohio
Dallas, Tex.
Denver, Colo.
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Hartford, Conn.
Houston, Tex.
Los Angeles, Calif.
New Orleans, La.
New York, N. Y.
San Francisco, Calif.
Vermillion, S. Dak.

A M D

**ASSOCIATED MICROFILM DEALERS, Inc.**
79 Clinton Place • Newark, New Jersey


Men for Management," struck a responsive chord in the members of our organization. It is, in our opinion, one of the best portrayals of the purposes and scope of the National Association of Foremen.

This council is trying to promote the Association in the Greater New York Area. We feel that a greater dissemination of your article in this area would further our aims.

*Earl Valet*
Acting Secretary
Greater New York Area
NAF Council

Dear Sir:

May we have your permission to reprint from your October issue the article on page 100 entitled "Communication starts with words so these foremen studied English," with the usual credit line as to source?

In so many situations this should be the obvious starting point, followed by conference leadership and basic economics training, before embarking on programs involving supervisory development and human relations.

We'd like to emphasize the point with this article.

*George Brenn*
Editor
*The Foreman's Digest*

AVAILABLE STUDIES

Villanova, Pa.

Dear Sir:

We have been intrigued by the comparative data on manufacturing lines which appeared in your December issue. One of our most important clients is a member of one industry for which data was furnished.

This brought up the subject of the complete study DUN & BRADSTREET makes periodically of all lines of enterprise and its availability. Could you advise us how this study could be obtained? We are anxious to secure this data if at all possible.

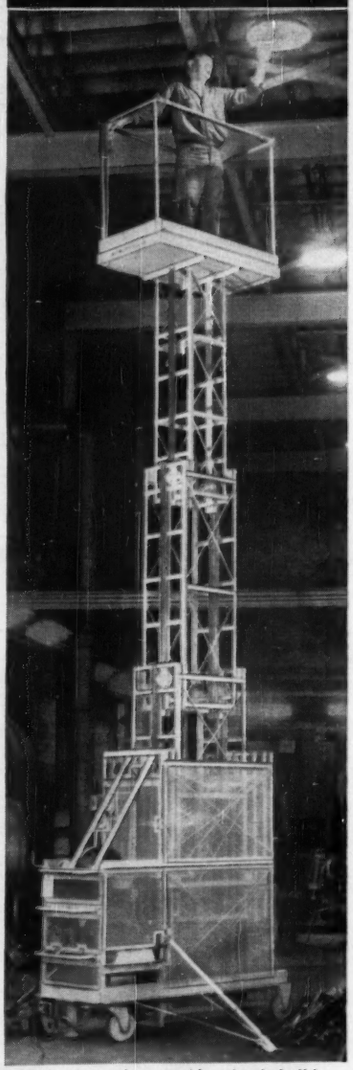
*John J. Shea*
Shea & Company

*The "Fourteen Important Ratios" for retail, wholesale, and manufacturing lines, which appeared in* DUN'S REVIEW AND MODERN INDUSTRY, *will soon be published in pamphlet form. This publication, along with "Operating Ratios for 33 Lines of Retail Trade" and "Cost of Do-*


THE MAN WHO FEELS SAFE WORKS BETTER

**Economy HI-REACH TELESCOPER**

*ENGINEERED FOR STRENGTH STABILITY AND SAFETY*



Safety is our first consideration in building Hi-Reach Telescopers.

During the past quarter of a century of making Hi-Reach Platform Telescopers, our engineers have constantly improved the mechanical construction to obtain maximum stability, smooth time-saving lifting action, and safety.

Standard Models available from 10'-9" to 35 ft. high, and custom-built units as high as 100 ft. if you like.

**ECONOMY ENGINEERING CO.** EST. 1901
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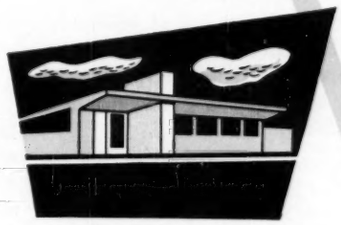
# MUELLER BRASS CO.

# FORGINGS

## *ARE MADE TO LAST!*

***QUALITY PARTS AND PRODUCTS FORGED AND MACHINED OF BRASS, BRONZE AND ALUMINUM OR MAGNESIUM***



### IN THE HOME

IMPELLER DISPOSER

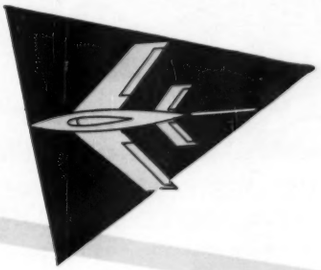
One of four Mueller Brass Co. parts in modern waste disposal unit. Completely dependable in daily operation.

WINDOW HARDWARE

Forged of natural bronze. Can be furnished in aluminum or chrome finish as desired. Retains original beauty indefinitely.

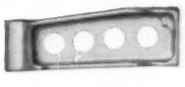
BURNER HEAD

Forged of aluminum for installation in gas stove. Lightweight yet strong.



### IN AVIATION

LANDING GEAR TORQUE ARM



SUPPORT MEMBER

INSTRUMENT HOUSING

These aluminum forgings provide the same strength as steel yet weigh only 1/3 as much. Smooth bright surfaces save machining time and eliminate costly finishing.

Specially designed forged housing for sealing diaphragm in aviation pressure warning unit.

### IN INDUSTRY

CONNECTING ROD

Forged from "600" series metal. Over two million connecting rods produced without recorded failure.

ACTUATING GEAR

Forged from special Mueller Brass Co. alloy. Must take constant pounding.

AUTOMOTIVE GEAR

Forged of "600" series metal for use in automotive automatic transmission. Replaced part that was giving constant trouble; solved costly problem.

All Mueller Brass Co. forgings, of which just a few are shown here, have a dense, close-grained structure with a high tensile strength. Weight savings up to 40% are possible in the design of parts because of the close tolerances to which they can be produced. Less scrap and longer tool life result from the easy machinability of forged parts. Mueller Brass Co. is completely equipped to design parts for your products, specify alloys (including special alloys developed by our metallurgists), forge, machine, finish and plate the parts and perform all necessary assembly operations. Write today for our free illustrated 32-page forgings catalog and complete information about MBCo forged parts for your products.

140

**MUELLER BRASS CO.** PORT HURON 46, MICHIGAN

# PEIRCE "Magnetic Belt"

## THE REALLY COMPLETE DICTATION SYSTEM

### EXCLUSIVE DESIGN COMBINES ALL 10 MOST-WANTED FEATURES

Consider This—of all dictation machines, only Peirce Magnetic Belt Dictation combines *every* feature essential to modern dictation ease, speed, accuracy, efficiency. *Precision Engineering,** perfected by Peirce, Magnetic Belt pioneer, assures you of *Minimum Service,* maximum efficiency. *Full 15-Minute Recording* gives you 50% *more* dictation time. *Transcriber Speed-Control* for selective dictation flow. *Absolute Interchangeability of Reusable* Magnetic Belt assures utmost *flexibility and economy.*

*Years-Ahead Styling* with low, graceful lines for compact beauty. *Combines Both Dictating—Transcribing,* or can be easily adapted to Peirce Multi-Station Network Dictation. All this and *Error-Free Dictation,* too, for instant correction. Write today for a *2 Week Free Trial,* and prove it yourself, in your own office, under your own conditions. *See why modern businessmen today use Peirce Magnetic Belt—the most modern dictation machine.*

**Dealers and Service in All Principal Cities**

***Ask your own engineering department to analyze the outstanding engineering in Peirce Magnetic Belt Dictation.**

**NOW! A CHOICE OF 3 NETWORK SYSTEMS TO FIT ANY OFFICE!**

Lowest Cost Network Dictation for Lighter, Less Frequent Dictation

Network Dictation for Offices With Heavy Dictation Loads

**NEWEST DEVELOPMENT**

Network Dictation Associated With Your Telephone See Your Phone Company.

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**PEIRCE DICTATION SYSTEMS**
**5900 NORTHWEST HIGHWAY**
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_____ Please Send Complete Information

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**5900 Northwest Highway • Chicago 31**


*ing Business" surveys for selected lines of retailing, can be secured by writing to the editors.*—Ed.

OFFICE MANAGEMENT ISSUE

Milford, Pa.

Dear Sir:

Referring to your very fine series of articles in your September issue on "Better Office Management," have you made reprints of any parts of these compositions?

The woods are full of business periodicals from A to Z, but your plainspoken and informed articles on the above subject were models of perspicacity.

*I. F. Van Wart*
The Hermitage

New York, N.Y.

Dear Sir:

The September issue of DUN'S REVIEW AND MODERN INDUSTRY with its series on "What's Wrong With Office Management?" was one of exceptional interest to us. Many of our members, in their positions as controllers, find that they must constantly cope with this question, particularly in view of the fact that so many companies are now considering a switch from punch card accounting to electronics accounting.

We quite frequently receive questions from members and others concerning the position of the controller in making decisions concerning office equipment. We feel that the article beginning on page 101 of your September issue furnishes a very effective answer. . . .

*Benjamin R. Makela*
Assistant Secretary
Controllers Institute of America

*This article was so popular that our entire stock of reprints, for which we are still receiving requests, has been exhausted. Two hundred copies of the issue in which it appeared are available and may be ordered from our Circulation Department at the regular magazine price. Please submit payment with order.*—Ed.

Letters may be addressed to Letters to the Editor, DUN'S REVIEW AND MODERN INDUSTRY, 99 Church Street, New York 8, N. Y.

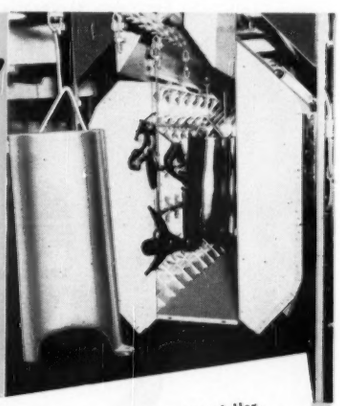

**REQUEST:**

*What can we do about costly drying operations?*

**REPLY:**

## REDUCE TIME AND EXPENSE WITH A FOSTORIA RADIANT OVEN

**Fostoria infrared puts the heat on the product . . . instantly. No wasteful "warm-up;" accurate heat control. You save money because drying is faster and more efficient.**



**CASE HISTORY:**

The above photo was taken at the Cream Separator Division of International Harvester at Richmond, Indiana. Operation shown is baking enamel finish coat on parts.

A few years ago, these parts were baked with a convection oven. It occupied 480 square feet of floor space and required a baking cycle of one hour.

The company now uses a Fostoria Radiant Oven. This unit costs less to buy. It is only eleven feet long, and bakes thoroughly in just eleven minutes.

Does this give you an idea? If there is a baking, heating or drying operation in your plant, it can be done faster, cheaper, better, and in less floor space with a Fostoria Oven.

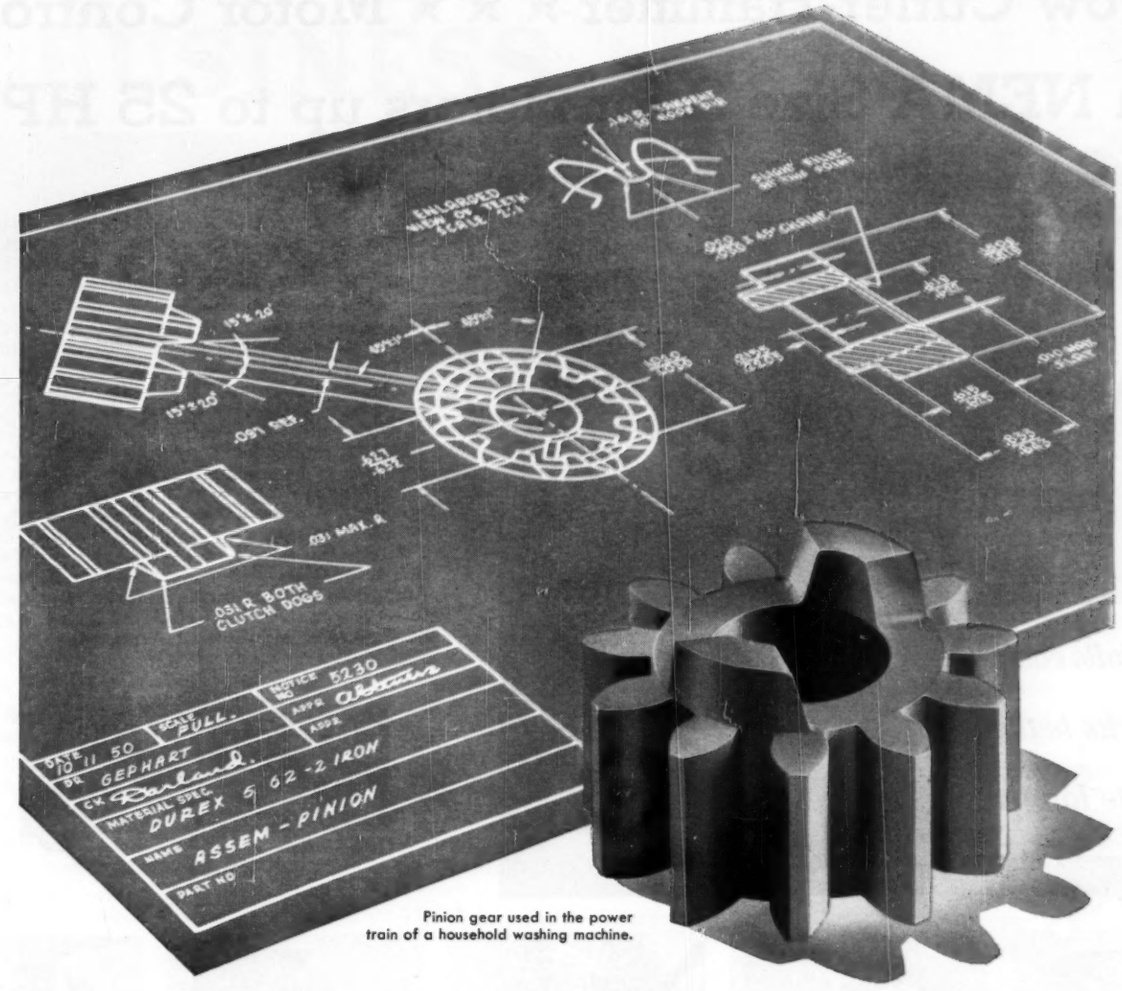
Find out about a specially-designed Fostoria Oven for your requirements. It'll pay for itself in a matter of months. Just contact our representative or write directly to the company.

8501

*Write for the free booklet, "How Thousands of Plants Cut Costs."*

INFRA-RED fostoria SYSTEM

**THE FOSTORIA PRESSED STEEL CORPORATION, DEPT. 218 FOSTORIA, OHIO**




Pinion gear used in the power train of a household washing machine.

# MORAINE METAL POWDER PARTS SOLVE MANY PRODUCTION PROBLEMS

Here you see a complex design that is being mass-produced today by metal powder techniques *with important savings in cost.*

The print in the background indicates the intricacy of the design, while the photograph in the foreground shows the part ready to be assembled into the final mechanism. And from raw material to what you see here took only *one press operation!*

This demonstrates what has come to be expected through cooperation between customer and Moraine.

Moraine's experience with metal powder is called upon almost daily to resolve complex designs into economical production jobs—just as Moraine almost daily contributes to modern industry by improving product performance and lowering costs.

**moraine products**
DIVISION OF GENERAL MOTORS, DAYTON, OHIO

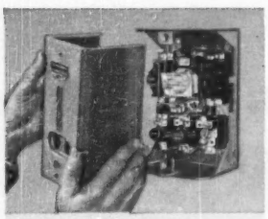
METAL POWDER PARTS

WHAT'S NEW IN MOTOR CONTROL? ★ ★ ★ GET IT FIRST IN CUTLER-HAMMER

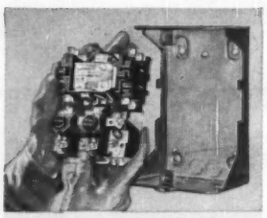
# Now Cutler-Hammer ★★★ Motor Control in NEMA Size 2 for motors up to 25 HP*

It is here . . . Cutler-Hammer ★★★ Motor Control for your larger motors, NEMA Size 2 Starters with the famous three stars on the Cutler-Hammer nameplate. The three stars that stand for three entirely new standards in motor control performance and value. Star #1: Installs easier. So much easier that installation savings often exceed the cost of the control. Star #2: Works better. So much better that this control often pays for itself many times over in just the production interruptions it avoids. Star #3: Lasts longer. So much longer that this control *never* needs maintenance care or expense in 90% of its uses. If you are one of the many users who have proved these are facts, not mere claims, you will welcome the news that your larger motors can now have this same control. Order Bulletin 9586, Size 2, today from your nearby Cutler-Hammer Authorized Distributor. He is stocked and ready to serve you. CUTLER-HAMMER, Inc., 1436 St. Paul Ave., Milwaukee 1, Wisconsin.

CUTLER-HAMMER
★ ★ ★
MOTOR CONTROL
C-H

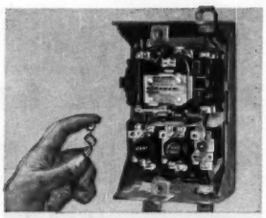


**3-D Accessibility**
Removing the wrap-around cover bares the entire starter for three-directional accessibility. It is wide open at front and both sides. You can see everything and reach anything. Wiring the starter is simplified and routine inspection is made so easy and complete nothing is ever neglected.

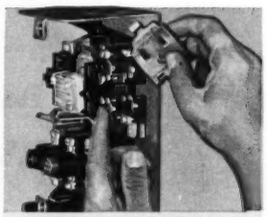


**Unit Panel Construction**
The entire starter mechanism can be removed from its case by simply loosening three screws. With mechanism out of the way, mounting case, connecting conduit and pulling wires is a cinch. A great time saver. No skinned knuckles. No damaged starter mechanisms.

**Full Three-Phase Protection**
Only *three* overload relays can provide positive three-phase protection to stop needless motor burn-outs and production interruptions. And only Cutler-Hammer offers three overload relays in *standard* starters without the excessive costs and delays of special starter constructions.



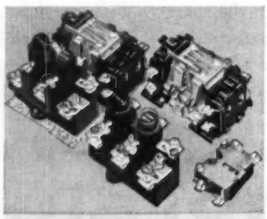
**Adjustable Sensing Coils**
Only the accurate adjustment of overload protection permits motors to work harder without damage. Now more important than ever with newer type small frame motors. Only C-H offers adjustable load sensing coils . . . for 3% loading accuracy instead of the 10% to 12% in all other controls.



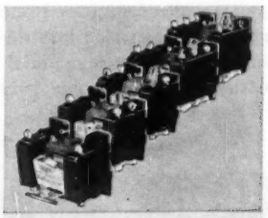
**Superlife Vertical Contacts**
Now the famous Cutler-Hammer dust-safe vertical contacts have been doubly improved. New light-weight design cuts bounce to reduce arcing. Also, arcing is now pressure-quenched. Contact maintenance care and costs are ended for all time in all normal motor control uses.

## For Control Panel Designers

The new Cutler-Hammer★★★ Motor Control offers an array of spectacular new features to provide many exclusive advantages in circuit planning, compact panel design, better motor protection and better control performance. Be sure you have complete design data on this advanced equipment. Write or wire today.



**New Control Components**
All parts of the new C-H ★★★ Starters in NEMA 0, 1 and 2 Sizes are available as components; also complete starters on convenient unit panels. Electrical interlocks are available to provide additional control circuits when desired.

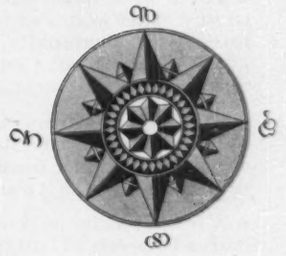


**New Control Relays**
Finest of control relays. 10 and 15 Amp. 2-3-4-5-6 poles. All contacts instantly convertible from NO to NC or vice versa. NO or NC status seen at a glance without removing cover. New armored magnet coils color coded for voltage and frequency.

**New SD & HD Pushbuttons**
New standard duty pushbutton station with pilot light offers many exclusive features, typical of complete C-H line. Watch soon for announcement of the revolutionary new line of C-H heavy duty oil-tight one-hole mounting pushbuttons.

# The Trend of BUSINESS AND Compass Points—QUARTERLY

PENNSYLVANIA MAIN LINE AT LEWISTOWN, PA.—HOWE PHOTOGRAPH



- *Rise in New Orders*
- *Round-up of 1955 Forecasts*
- *Where Are the New Markets?*
- *Collections Improve Again*
- *New Peak in Spending*

FLOWING like a fresh-meadow ditch in Springtime have been the forecasts about the level of business during 1955. While virtually all pronouncements envision a more prosperous nation in 1955, the agreement is not at all unanimous on the degree of prosperity.

Hundreds of outlook statements from individual companies and trade associations, and from government officials point to a new all-time high in total business activity this year (Compass Point 20). Professional economists are noticeably less united.

While most economists look for 1955's gross national product to top that of 1954, they are rather reluctant to place the 1955 total above the peak of $365 billion in 1953. Several widely known economists insist that the present recovery is deceptive, that inventory liquidation has not gone far enough, and that while 1955 has come in like a bull, it will go out like a bear. Others scan the economic horizon, find it barren of stimulants, and offer nothing but that weary word, "stability."

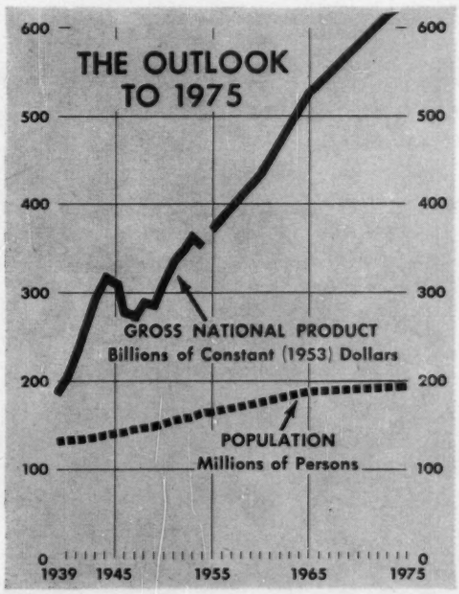
However, the recovery which began last Fall would be most unusual were it merely a false start. Only once in recent decades—in the most trying year 1931—has a business rise, once begun, failed to develop into a real recovery.

Since so many significant segments of the economy—new orders, steel production, consumer spending, personal income, defense orders, inventories—have been rising together in recent months, it is unlikely that the recovery, which has become to some extent self-generating, will slip into a sinking spell in the near future.

Spot reports from DUN & BRADSTREET reporters in 60 cities in 39 states indicated that employment, production, retail trade, and new orders in January were performing to warm the hearts of assorted optimists and were being outpaced by only one factor, business confidence. While there was little evidence of a restocking splurge, reminiscent of that in 1952 and early 1953, business men were much less fearful of expanding their inventories than a few months ago (Compass Points 27, 28, and 29).

## *The Long-Term Outlook*

The possibilities for the next decade or two are set forth in several independent economic studies. One, prepared for the Joint Congressional Committee on the Economic Report, is called "Potential Economic Growth of the United States during the Next Decade." This rather comprehensive analysis of the prospects for 1965 concludes that a gross national product of $535 billion is a fair estimate for 1965, with $525 billion a possible minimum. These figures are expressed in 1953 dollars in order to measure more accurately the potential change in the physical volume of output. This minimum estimate for GNP for 1965, at $525 billion, is 47 per cent above the physical output in 1954 (chart on this page).




The projections are extended to 1975 on the basis of data from a report of the President's Materials Policy Commission called *Resources for Freedom,* otherwise known as "the Paley Report." The figure suggested for gross national product for 1975 is $634 billion, in terms of 1953 price levels. This, in physical volume, is 78 per cent above the 1954 level.

There is agreement with the $525 billion projection for 1965 in a third study prepared under the direction of Beardsley Ruml by the National Citizens Commission for the Public Schools. As its title, "Financing Public Education in the Decade Ahead," suggests, the study is primarily concerned with the financial needs and resources

***The gross national product curve extending from 1955 to 1975 is derived from various estimates described in the text above; it is what might be called a "trend line" and individual points on the curve should not be taken too literally. GNP for any given year might vary above or below the trend, although the underlying assumptions on which the estimates are based point to an upward swing over the long term. The date 1975 is used merely to fix a time between 1970 and 1980.***

## *Regional Highlights . . .*

- **There were more businesses in operation in New York (544,300) in 1954 than in any other state, while Nevada, with 6,900 concerns had the fewest operating businesses. Regionally, declines in the number of businesses in the New England, Middle East, Central, and Northwest areas contrasted with gains in the Southeast, Southwest, and the Far West.**
- **Cash receipts from farm marketings in 1954 were higher than a year ago in only one region, the South Central, where they rose 4 per cent. Declines from a year ago ranged from 1 per cent in the West North Central Region to 8 per cent in the North Atlantic states.**
- **A new 70-mile parkway to circle the Pocono Mountains will involve expenditures between $17-20,000,000, will attract an estimated 1,500,000 pleasure cars annually, a considerable financial fillip for northeastern Pennsylvania.**
- **Miami hotel and apartment house occupancy in January was above the corresponding 1954 level and close to capacity.**

of the public schools. In weighing our ability to finance education, certain basic assumptions were made about the economy in general from which the 1965 gross national product was derived. These assumptions are similar to those used as a basis for the other studies; the Census Bureau's estimates for population and the size of the labor force formed the starting points. Then certain levels of employment, productivity, and hours of work were conjectured.

All of the studies assumed that employment could be maintained at a maximum level, with unemployment at 4 per cent, or less, of the labor force. It was thought that the increase in productivity per man-hour would be close to 3 per cent a year for the next decade. It was assumed that the average number of hours in the workweek would continue to decline slightly, that government spending would remain high, and that there would be no significant change in our international relations.

### *The Months Ahead*

Short of sorcery, there are several ways for a business man to gain a glimpse of the future. He can listen attentively to the economists and he can scan the latest surveys on what business men expect to buy and sell in the coming months. Expectations surveys have proved rather reliable in recent years since they reflect the planned actions of the decisionmakers.

There has been a spectacular improvement in business men's expectations during the past three months. When interviewed by DUN & BRADSTREET reporters in October 1954, 56 per cent of the executives expected their net sales in the first quarter of 1955 to top those of a year earlier. In January interviews, however, about 72 per cent of the executives participating in the DUN & BRADSTREET survey expected their sales in the second quarter of 1955 to surpass those of a year before.

Reflecting the cost squeeze in many industries, business men did not expect their profits to gain as much as sales. While most business men still were determined to keep their inventories at present levels, a growing proportion (32 per cent) expected to boost their stocks. An overwhelming majority (68 per cent) looked for larger orders during the second quarter than a year before, while only 5 per cent thought that they would receive fewer orders.

BUSINESS MEN'S EXPECTATIONS

| SECOND QUARTER 1955 Compared with SECOND QUARTER 1954 | Per Cent of Executives Expecting Increase | No Change | Decrease |
|---|---|---|---|
| NET SALES | 71 | 23 | 6 |
| NET PROFITS | 54 | 40 | 6 |
| SELLING PRICES | 16 | 74 | 10 |
| LEVEL OF INVENTORIES | 31 | 53 | 16 |
| NUMBER OF EMPLOYEES | 16 | 79 | 5 |
| MANUFACTURERS' ORDERS | 68 | 27 | 5 |

### *Sources of Demand*

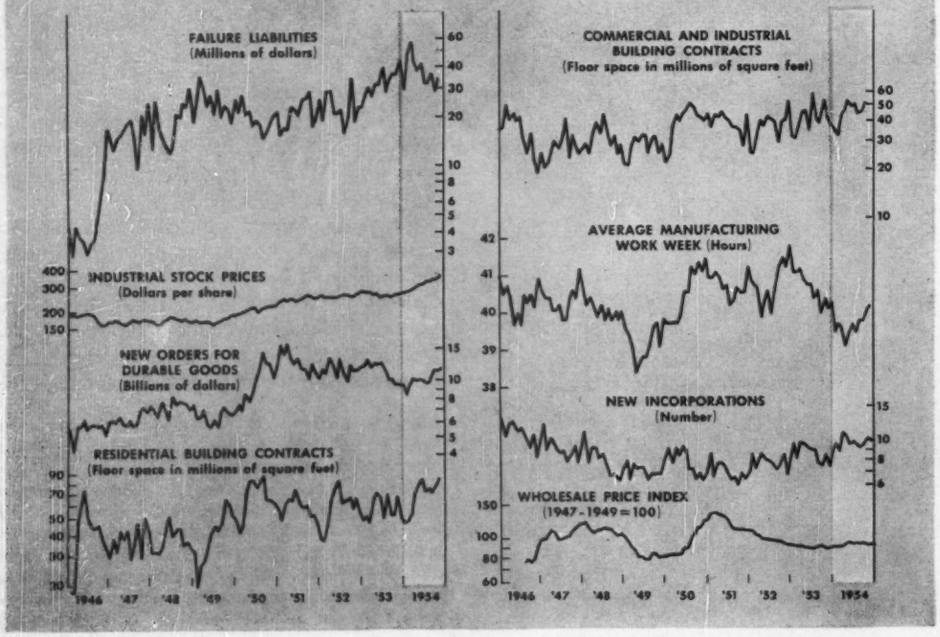
One of the favorite statistics used in drawing a fix on economic activity is the gross national product. Since this concept encompasses all goods and services in the economy, its movements are both glacial and obscuring.

To diminish this obscurity and determine where the profitable markets may materialize this year, a tour of the various segments of the economy should be attempted. Of the basic sources of demand—consumer expenditures, private capital expenditures, and government purchases—the first is the largest, while the others exert considerable leverage throughout the economy.

Consumer spending, the comforting cushion which helped to brake the decline in total business last year, should, if present trends continue, offer massive support this year. An extra $10 bil-

*Continued on page 29*

**BELL-WETHER INDICATORS FORETELL UPTURN**


FAILURE LIABILITIES (Millions of dollars)
INDUSTRIAL STOCK PRICES (Dollars per share)
NEW ORDERS FOR DURABLE GOODS (Billions of dollars)
RESIDENTIAL BUILDING CONTRACTS (Floor space in millions of square feet)
COMMERCIAL AND INDUSTRIAL BUILDING CONTRACTS (Floor space in millions of square feet)
AVERAGE MANUFACTURING WORK WEEK (Hours)
NEW INCORPORATIONS (Number)
WHOLESALE PRICE INDEX (1947-1949=100)
1946 '47 '48 '49 '50 '51 '52 '53 1954

***These eight "leading series" were chosen by the National Bureau of Economic Research as indicators which tend to precede the course of business. An advance in general activity usually follows when failure liabilities drop and the other seven series rise. In the fourth quarter of 1954, six of the indicators were higher than in the preceding quarter. While failure liabilities turned up somewhat in the last two months of the year, for the fourth quarter they averaged 19 per cent below the level in the first six months of 1954.***

## Haven't I seen you someplace before?

Haven't I seen you in a skyscraper? You were tall and thin. And wasn't that you in the bank vault too? You were very husky then—stout and immensely sturdy. That was you, I'm sure, spun into a smooth cone at the nose of a DC-7 over Denver. Certainly. And I see you every day parked in the drive beside the house. The body of my automobile is made from you, and you are very sleek indeed. You're *steel*. I tell you I'd know you anywhere. But I suppose that isn't true. Do I recognize you in a modern home? You're there, reliable and strong, the I-beam under the floor, the heating ducts in the wall, the insides of the furnace. You're in the newsreels, of course. You're the battleship Missouri and the Patton tank. You're that new French bathyscaphe exploring the bottom of the sea 13,000 feet down. You're everywhere that strength is required. The things that are meant to stand up—are made of *steel*. I'm going to see to it you're in my life. You'll be in my garage door, my storm doors, my casement windows. You'll be in my barbecue grill, my lawn mower, my garden furniture. You'll be in my kitchen cabinets, my refrigerator, my stove. You'll be in my home and my office too—in my modern desk, my streamlined file cabinets, my air-conditioning unit. I'll tell you why. I'll take steel because steel can take it. And if it's made of steel, I can afford it. *Steel is strongest . . . Steel lasts longest . . . Steel guards best . . . Steel costs less.*

NATIONAL STEEL CORPORATION

*GRANT BUILDING, PITTSBURGH, PA.*

Owning and operating Great Lakes Steel Corporation
Weirton Steel Company • Stran-Steel Division
Hanna Iron Ore Company • National Mines
Corporation • The Hanna Furnace Corporation • National Steel Products Company

# 39 COMPASS POINTS OF BUSINESS

| | CENSUS | | EMPLOYMENT | | | | PRICES | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1 POPULATION *Millions* | 2 NAMES IN REFERENCE BOOK *Thousands* | 3 EMPLOYMENT Civilian *Millions* | 4 EMPLOYMENT Agricultural *Millions* | 5 EMPLOYMENT Nonagricultural *Millions* | 6 UNEMPLOYMENT *Millions* | 7 CONSUMERS' PRICES *Index* | 8 RETAIL PRICES *Index* | 9 WHOLESALE PRICES *Index* | 10 INDUSTRIAL STOCK PRICE AVERAGES *Dollars* |
| 1914 | 99.1 | 1,655 | 37.6 | 11.4 | 26.2 | ... | 42.9 | .... | 43.3 | 81.03 |
| 1919 | 105.1 | 1,711 | 42.0 | 10.5 | 31.5 | ... | 74.0 | .... | 88.1 | 99.78 |
| 1920 | 106.5 | 1,821 | 41.3 | 10.7 | 30.6 | ... | 85.7 | .... | 98.1 | 90.04 |
| 1921 | 108.5 | 1,927 | 37.7† | 10.8† | 26.9† | ... | 76.4 | .... | 62.0 | 73.48 |
| 1929 | 121.8 | 2,213 | 47.6 | 10.0 | 36.3 | 1.5 | 73.3 | 120.9 | 61.9 | 311.24 |
| 1930 | 123.1 | 2,183 | 45.5 | 9.9 | 34.3 | 4.3 | 71.4 | .... | 56.1 | 236.34 |
| 1931 | 124.0 | 2,125 | 42.4 | 9.8 | 31.3 | 8.0 | 65.0 | .... | 47.4 | 138.58 |
| 1932 | 124.8 | 2,077 | 38.9 | 9.7 | 28.0 | 12.1 | 58.4 | .... | 42.8 | 64.57 |
| 1939 | 130.9 | 2,116 | 45.8 | 9.3 | 35.6 | 9.5 | 59.4 | 99.0 | 50.1 | 142.66 |
| 1940 | 132.0 | 2,156 | 47.5 | 9.5 | 38.0 | 8.1 | 59.9 | 100.6 | 51.1 | 134.74 |
| 1941 | 133.2 | 2,171 | 50.4 | 9.1 | 41.3 | 5.6 | 62.9 | 108.3 | 56.8 | 121.82 |
| 1942 | 134.7 | 2,156 | 53.8 | 9.3 | 44.5 | 2.7 | 69.7 | 124.9 | 64.2 | 107.20 |
| 1943 | 136.5 | 2,027 | 54.5 | 9.1 | 45.4 | 1.1 | 74.0 | 134.0 | 67.0 | 134.81 |
| 1944 | 138.1 | 1,859 | 54.0 | 9.0 | 45.0 | .7 | 75.2 | 137.5 | 67.6 | 143.32 |
| 1945 | 139.6 | 1,913 | 52.8 | 8.6 | 44.2 | 1.0 | 76.9 | 141.4 | 68.8 | 169.82 |
| 1946 | 141.3 | 2,146 | 55.2 | 8.3 | 46.9 | 2.3 | 83.4 | 155.2 | 78.7 | 191.65 |
| 1947 | 144.0 | 2,410 | 58.0 | 8.3 | 49.8 | 2.1 | 95.5 | 180.1 | 96.4 | 177.58 |
| 1948 | 146.6 | 2,555 | 59.4 | 8.0 | 51.4 | 2.1 | 102.8 | 192.7 | 104.4 | 179.95 |
| 1949 | 149.2 | 2,684 | 58.7 | 8.0 | 50.7 | 3.4 | 101.8 | 187.7 | 99.2 | 179.48 |
| 1950 | 151.7 | 2,692 | 60.0 | 7.5 | 52.5 | 3.1 | 102.8 | 189.0 | 103.1 | 216.31 |
| 1951 | 154.4 | 2,614 | 61.0 | 7.1 | 54.0 | 1.9 | 111.0 | 206.8 | 114.8 | 257.64 |
| 1952 | 157.0 | 2,643 | 61.3 | 6.8 | 54.5 | 1.7 | 113.5 | 210.4 | 111.6 | 270.76 |
| 1953 | 159.7 | 2,673 | 61.9 | 6.5 | 55.4 | 1.5 | 114.4 | 209.1 | 110.1 | 275.96 |
| 1954 | 162.4 | 2,639 | 61.2 | 6.5 | 54.7 | 3.2 | 114.9 | 208.6 | 110.2 | 333.91 |
| '54 I | 161.3 | 2,660 | 60.0 | 5.6 | 54.4 | 3.5 | 115.0 | 208.9 | 110.3 | 292.64 |
| '54 II | 162.0 | 2,641 | 61.3 | 6.8 | 54.4 | 3.3 | 114.9 | 208.6 | 110.3 | 320.56 |
| '54 III | 162.7 | 2,642 | 62.1 | 7.3 | 54.8 | 3.2 | 115.0 | 209.0 | 110.3 | 346.67 |
| '54 IV | 163.5 | 2,905 | 61.5 | 6.2 | → 55.3 | 2.8 | 114.6 | 207.9 | 109.7 | → 375.79 |

| | SALES | | | | | | INVENTORIES | | |
|---|---|---|---|---|---|---|---|---|---|
| | 21 FARM RECEIPTS *Million dollars* | 22 EXPORTS *Million dollars* | 23 IMPORTS *Million dollars* | 24 RETAIL SALES *Million $* | 25 WHOLESALE SALES *Million $* | 26 MANUFACTURING SALES *Million $* | 27 RETAIL INVENTORIES *Million $* | 28 WHOLESALE INVENTORIES *Million $* | 29 MANUFACTURING INVENTORIES *Million $* |
| 1914 | 6,039 | 2,114 | 1,789 | ... | ... | ... | ... | ... | ... |
| 1919 | 14,570 | 7,920 | 3,904 | 36,549 | ... | 60,509 | ... | ... | 12,906 |
| 1920 | 12,606 | 8,228 | 5,278 | 41,364 | ... | 63,659 | ... | ... | 13,484 |
| 1921 | 8,116 | 4,485 | 2,509 | 32,954 | ... | 41,897† | ... | ... | 10,705† |
| 1929 | 11,299 | 5,241 | 4,399 | 48,459 | 37,814 | 70,262 | 7,298 | 4,024 | 12,775 |
| 1930 | 9,050 | 3,843 | 3,061 | 41,989 | ... | 57,017 | ... | 3,497 | 11,265 |
| 1931 | 6,369 | 2,424 | 2,091 | 34,752 | ... | 42,951 | ... | 2,665 | 9,105 |
| 1932 | 4,735 | 1,611 | 1,323 | 25,013 | ... | 30,774 | ... | 2,307 | 7,332 |
| 1939 | 8,582 | 3,177 | 2,318 | 42,042 | 26,244† | 61,340 | 5,285 | 3,075† | 11,516 |
| 1940 | 9,056 | 4,021 | 2,625 | 46,375 | 28,919 | 70,313 | 5,819 | 3,255 | 12,873 |
| 1941 | 11,619 | 5,147 | 3,345 | 55,274 | 36,394 | 98,069 | 7,371 | 4,073 | 17,024 |
| 1942 | 16,136 | 8,079 | 2,756 | 57,212 | 41,109 | 125,158 | 7,438 | 3,830 | 19,348 |
| 1943 | 20,003 | 12,965 | 3,381 | 63,235 | 45,966 | 153,843 | 7,065 | 3,759 | 20,171 |
| 1944 | 21,153 | 14,259 | 3,929 | 70,208 | 49,828 | 165,387 | 7,105 | 3,969 | 19,578 |
| 1945 | 22,125 | 9,806 | 4,159 | 78,304 | 53,708 | 154,481 | 7,442 | 4,625 | 18,457 |
| 1946 | 25,336 | 9,738 | 4,942 | 102,488 | 71,915 | 151,402 | 11,231 | 6,606 | 24,620 |
| 1947 | 30,020 | 14,430 | 5,756 | 119,604 | 87,263 | 191,010 | 13,372 | 7,613 | 29,032 |
| 1948 | 30,464 | 12,653 | 7,124 | 130,521 | 95,172 | 211,560 | 15,190 | 7,982 | 31,782 |
| 1949 | 28,129 | 12,051 | 6,622 | 130,721 | 88,252 | 196,997 | 14,570 | 7,913§ | 29,038 |
| 1950 | 28,611 | 10,275 | 8,852 | 143,689† | 103,896 | 231,415 | 18,699§ | 10,474 | 34,534§ |
| 1951 | 33,084§ | 15,030 | 10,967 | 158,223 | 113,168 | 266,460 | 19,904 | 11,068 | 43,123 |
| 1952 | 32,648 | 15,177 | 10,714 | 164,085 | 112,325 | 276,548 | 20,234 | 11,310 | 44,442 |
| 1953 | 31,188 | 15,698 | 10,875 | 170,742 | 111,990 | 303,356 | 21,208 | 11,695 | 46,947 |
| 1954 | 30,275 | 15,155 | 10,004 | 170,726 | 109,106 | 287,993 | 22,364 | 11,784 | 43,606 |
| '54 I | 6,603 | 3,394 | 2,501 | 37,944 | 25,260 | 71,332 | 23,321 | 11,843 | 45,959 |
| '54 II | 6,152 | 4,298 | 2,733 | 43,246 | 26,742 | 72,127 | 22,131 | 11,563 | 44,675 |
| '54 III | 7,985 | 3,549 | 2,427 | 42,333 | 28,608 | 70,615 | 22,161 | 11,627 | 43,659 |
| '54 IV | 9,535 | 3,914 | 2,343 | → 47,203 | 28,550 | 73,919 | 22,364 | 11,784 | → 43,606 |

→ Quarterly figures that are significant either for their change or their lack of change from previous levels.
Fourth quarter figures for most series are based upon preliminary estimates and incomplete data.
Sources of the statistical series and additional information concerning the figures are obtainable on request.

# . . . . . a record of business activity

## INCOME

| 11 WEEKLY HOURS Indust. Workers *Hours* | 12 WEEKLY EARNINGS Indust. Workers *Dollars* | 13 DISPOSABLE PERSONAL INCOME *Billion Dollars* | 14 DISPOSABLE INCOME Per Capita *1954 Dollars* | 15 CORPORATE PROFITS AFTER TAXES *Billion dollars* | |
|---|---|---|---|---|---|
| 49.4 | 11.01 | 33.2 | 894 | 1.9 | 1914 |
| 46.3 | 22.08 | 63.5 | 934 | 5.7 | 1919 |
| 47.4 | 26.30 | 66.8 | 838 | 3.9 | 1920 |
| 43.1 | 22.18 | 52.8 | 730 | 0.0 | 1921 |
| 44.2 | 25.03 | 83.1§ | 1,069§ | 8.3§ | 1929 |
| 42.1 | 23.25 | 74.4 | 973 | 2.5 | 1930 |
| 40.5 | 20.87 | 63.8 | 908 | —1.3 | 1931 |
| 38.3 | 17.05† | 48.7 | 766 | —3.4 | 1932 |
| 37.7 | 23.86 | 70.4 | 1,041 | 5.0 | 1939 |
| 38.1 | 25.20 | 76.1 | 1,106 | 6.5 | 1940 |
| 40.6 | 29.58 | 93.0 | 1,274 | 9.4 | 1941 |
| 42.9 | 36.65 | 117.5 | 1,435 | 9.5 | 1942 |
| 44.9 | 43.14 | 133.5 | 1,517 | 10.5 | 1943 |
| 45.2 | 46.08 | 146.8 | 1,621 | 10.4 | 1944 |
| 43.4 | 44.39 | 150.4 | 1,607 | 8.3 | 1945 |
| 40.4 | 43.82 | 159.2 | 1,551 | 13.4 | 1946 |
| 40.4 | 49.97 | 169.0 | 1,412 | 18.2 | 1947 |
| 40.1 | 54.14 | 187.6 | 1,429 | 20.3 | 1948 |
| 39.2 | 54.92 | 188.2 | 1,423 | 15.8 | 1949 |
| 40.5 | 59.33 | 206.1 | 1,518 | 22.1 | 1950 |
| 40.7 | 64.77 | 226.1 | 1,517 | 18.7 | 1951 |
| 40.7 | 67.97 | 236.9 | 1,527 | 17.2 | 1952 |
| 40.5 | 71.69 | 250.1 | 1,573 | 18.3 | 1953 |
| 39.7 | 71.60 | 253.6 | 1,561 | 17.8 | 1954 |
| 39.5 | 70.97 | 252.3• | 1,561• | 17.5• | I '54 |
| 39.3 | 70.87 | 252.9• | 1,560• | 17.5• | II '54 |
| 39.6 | 71.28 | 253.2• | 1,553• | 17.0• | III '54 |
| 40.3 | → 73.30 | 255.9• | 1,569• | 17.8• | IV '54 |

## PRODUCTION

| 16 INDUSTRIAL PRODUCTION (PHYSICAL) *Index* | 17 ELECTRIC POWER PRODUCTION *Billions kwh* | 18 BUILDING PERMITS 120 Cities *Million $* | 19 EXPENDITURES FOR PLANT & EQUIPMENT *Billion dollars* | 20 GROSS NATIONAL PRODUCT *Billion dollars* | |
|---|---|---|---|---|---|
| 33 | ... | 735 | ... | 38.5 | 1914 |
| 39 | ... | 1,181 | ... | 77.9 | 1919 |
| 41 | 56.6 | 1,256 | ... | 86.2 | 1920 |
| 31 | 53.1 | 1,493 | ... | 70.3 | 1921 |
| 59 | 116.7 | 2,490 | 9.2 | 104.4§ | 1929 |
| 49 | 114.6 | 1,408 | 7.6 | 91.1 | 1930 |
| 40 | 109.4 | 1,006 | 4.7 | 76.3 | 1931 |
| 31 | 99.4 | 336 | 2.6 | 58.5 | 1932 |
| 58 | 161.3 | 1,029 | 5.5 | 91.1 | 1939 |
| 67 | 179.9 | 1,104 | 6.5 | 100.6 | 1940 |
| 87 | 208.3 | 1,196 | 8.2 | 125.8 | 1941 |
| 106 | 233.1 | 644 | 6.1 | 159.1 | 1942 |
| 127 | 267.5 | 419 | 4.5 | 192.5 | 1943 |
| 125 | 279.5 | 709 | 5.2 | 211.4 | 1944 |
| 107 | 271.3 | 1,028 | 8.7 | 213.6 | 1945 |
| 90 | 269.6 | 2,089 | 14.8 | 209.2 | 1946 |
| 100 | 307.4 | 2,470 | 20.6 | 232.2 | 1947 |
| 104 | 336.8 | 3,111 | 22.1 | 257.3 | 1948 |
| 97 | 345.6 | 3,131 | 19.3 | 257.3 | 1949 |
| 112 | 388.7 | 4,466 | 20.6 | 285.1 | 1950 |
| 120 | 432.3 | 3,654 | 25.6 | 328.2 | 1951 |
| 124 | 463.1 | 3,523 | 26.5 | 346.1 | 1952 |
| 134 | 516.5 | 4,034 | 28.4 | 364.9 | 1953 |
| 125 | 533.4 | 4,143 | 26.6 | 357.1 | 1954 |
| 124* | 131.5 | 948 | 6.2 | 355.8• | I '54 |
| 124* | 131.4 | 1,119 | 6.9 | 356.0• | II '54 |
| 123* | 138.6 | 1,084 | 6.6 | 355.5• | III '54 |
| → 128* | 131.9 | 992 | 6.9 | 361.0• | IV '54 |

## FEDERAL

| 30 FEDERAL RECEIPTS *Million dollars* | 31 FEDERAL EXPENDITURES *Million dollars* | 32 GROSS FEDERAL DEBT *Billion dollars* | |
|---|---|---|---|
| 735 | 735 | 1.2 | 1914 |
| 5,152 | 18,515 | 25.5 | 1919 |
| 6,695 | 6,403 | 24.3 | 1920 |
| 5,625 | 5,116 | 24.0 | 1921 |
| 4,033 | 3,299 | 16.9 | 1929 |
| 4,178 | 3,440 | 16.2 | 1930 |
| 3,190 | 3,652 | 16.8 | 1931 |
| 2,006 | 4,535 | 19.5 | 1932 |
| 5,103‡ | 8,966‡ | 40.4 | 1939 |
| 5,265 | 9,183 | 43.0 | 1940 |
| 7,227 | 13,387 | 49.0 | 1941 |
| 12,696 | 34,187 | 72.4 | 1942 |
| 22,202 | 79,622 | 136.7 | 1943 |
| 43,892 | 95,315 | 201.0 | 1944 |
| 44,762 | 98,703 | 258.7 | 1945 |
| 40,027 | 60,703 | 269.4 | 1946 |
| 40,043 | 39,289 | 258.3 | 1947 |
| 42,211 | 33,791 | 252.3 | 1948 |
| 38,246 | 40,057 | 252.8 | 1949 |
| 37,045 | 40,167 | 257.4 | 1950 |
| 48,142 | 44,633 | 255.2 | 1951 |
| 62,129 | 66,145 | 259.1 | 1952 |
| 65,218 | 74,607 | 266.1 | 1953 |
| 70,613 | 62,950 | 273.5 | 1954 |
| 24,100§ | 15,320§ | 270.2§ | I '54 |
| 20,340 | 17,807 | 271.3 | II '54 |
| 13,229 | 16,577 | 273.6 | III '54 |
| 12,944 | 13,264 | 278.8 | IV '54 |

## FINANCE

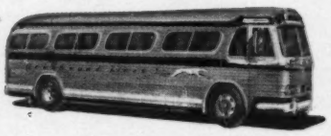
| 33 CONSUMER CREDIT Outstanding *Billion dollars* | 34 LOANS OF COMMERCIAL BANKS *Billion dollars* | 35 CURRENCY OUTSIDE OF BANKS *Million $* | 36 DEMAND DEPOSITS ADJUSTED *Million $* | 37 INTEREST ON BUSINESS LOANS *Per cent* | |
|---|---|---|---|---|---|
| ... | 13.2 | 1,533 | 10,082 | ... | 1914 |
| ... | 22.4 | 3,593 | 17,624 | 6.58 | 1919 |
| ... | 28.1 | 4,105 | 19,616 | 6.68 | 1920 |
| ... | 26.1 | 3,677 | 17,113 | 5.53 | 1921 |
| 6.4 | 35.7 | 3,557 | 22,809 | 5.83 | 1929 |
| 5.8 | 34.5 | 3,605 | 20,967 | 4.85 | 1930 |
| 4.8 | 29.2 | 4,470 | 17,412 | 4.30 | 1931 |
| 3.6 | 21.8 | 4,669 | 15,728 | 4.71 | 1932 |
| 7.2 | 17.2 | 6,401 | 29,793 | 2.10 | 1939 |
| 8.4 | 18.8 | 7,325 | 34,945 | 2.10 | 1940 |
| 9.2 | 21.7 | 9,615 | 38,992 | 2.00 | 1941 |
| 6.0 | 19.2 | 13,946 | 48,922 | 2.20 | 1942 |
| 4.9 | 19.1 | 18,837 | 60,803 | 2.60 | 1943 |
| 5.1 | 21.6 | 23,505 | 66,930 | 2.40 | 1944 |
| 5.7 | 26.1 | 26,490 | 75,851 | 2.20 | 1945 |
| 8.4 | 31.1 | 26,730 | 83,314 | 2.10 | 1946 |
| 11.6 | 38.1 | 26,476 | 87,121 | 2.10 | 1947 |
| 14.4 | 42.5 | 26,079 | 85,520 | 2.50 | 1948 |
| 17.1 | 43.0 | 25,415 | 85,750 | 2.70 | 1949 |
| 20.8 | 52.2 | 25,398 | 92,272 | 2.70 | 1950 |
| 21.5 | 57.7 | 26,315 | 98,234 | 3.10 | 1951 |
| 25.8 | 64.3 | 27,494 | 101,500 | 3.50 | 1952 |
| 28.9 | 68.3 | 28,091 | 103,300 | 3.69 | 1953 |
| 28.7 | 67.0 | 27,300 | 103,802 | 3.61 | 1954 |
| 28.2 | 67.1 | 26,900 | 96,700 | 3.72 | I '54 |
| 28.4 | 66.9 | 26,864 | 98,477 | 3.60 | II '54 |
| 28.8 | 67.0 | 26,867 | 100,200 | 3.56 | III '54 |
| → 29.4 | 67.0 | → 27,300 | 103,802 | 3.58 | IV '54 |

## FAILURES

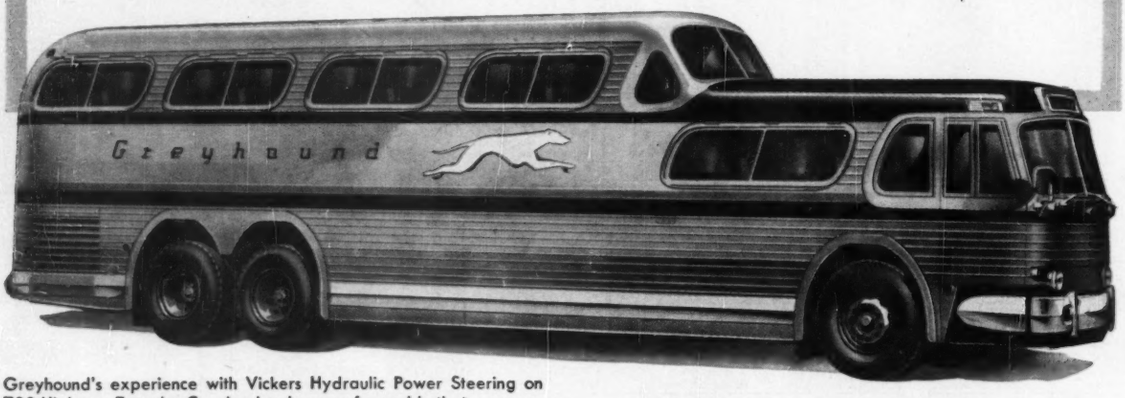
| 38 BUSINESS FAILURES *Number* | 39 LIABILITIES OF FAILURE *Million $* | |
|---|---|---|
| 18,280 | 357.9 | 1914 |
| 6,451 | 113.3 | 1919 |
| 8,881 | 295.1 | 1920 |
| 19,652 | 627.4 | 1921 |
| 22,909 | 483.3 | 1929 |
| 26,355 | 668.3 | 1930 |
| 28,285 | 736.3 | 1931 |
| 31,822 | 928.3 | 1932 |
| 14,768 | 182.5 | 1939 |
| 13,619 | 166.7 | 1940 |
| 11,848 | 136.1 | 1941 |
| 9,405 | 100.8 | 1942 |
| 3,221 | 45.3 | 1943 |
| 1,222 | 31.7 | 1944 |
| 810 | 30.2 | 1945 |
| 1,130 | 67.3 | 1946 |
| 3,476 | 204.6 | 1947 |
| 3,252 | 234.6 | 1948 |
| 9,246 | 308.1 | 1949 |
| 9,162 | 248.3 | 1950 |
| 8,058 | 259.4 | 1951 |
| 7,611 | 283.3 | 1952 |
| 8,862 | 394.2 | 1953 |
| 11,037 | 467.9 | 1954 |
| 2,895 | 134.6 | I '54 |
| 2,834 | 127.9 | II '54 |
| 2,587 | 101.2 | III '54 |
| 2,721 | 104.2 | IV '54 |

†Figures for this and prior dates are from another source and are not strictly comparable with later data.
‡Beginning in 1937 tax refunds are deducted from receipts and are not included among expenditures.
•Annual rate seasonally adjusted. *Quarterly figures seasonally adjusted. §Series revised from this date.

# Greyhound Likes the Performance of VICKERS® HYDRAULIC POWER STEERING on 700 Highway Traveler Coaches



# ...That's why the 500 New SCENICRUISERS have VICKERS® Hydraulic Power Steering

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**ENGINEERS AND BUILDERS OF OIL HYDRAULIC EQUIPMENT SINCE 1921**

lion in total business may very well develop from the confident performance of the nation's consumers who are steadily growing in number (Compass Points 1 and 13).

The latest survey of consumer attitudes, by the Survey Research Center of the University of Michigan, points to brighter buying plans for many consumer durables in the early months of this year. A more telling clue as to the attitudes of shoppers can be found in the most recent data on retail trade. Astounding even the most optimistic seers, retail trade in December 1954 expanded explosively to an unheard of total of $18 billion, thus bringing total retail sales volume for the entire year to a new all-time record of $170.8 billion.

This near-spree in spending carried over in January 1955 when total trade (according to preliminary reports from 60 cities in 39 states) was about 4 per cent above January 1954 when retail sales had been at the highest January level on record (Compass Point 24).

Last year, the dip in purchases of consumer durables was offset by a rise in soft goods and services. All three are expected to expand this year. The decline in personal income which is, of course, linked to employment was balanced last year by rises in unemployment insurance benefits, Social Security payments, and declines in taxes and the rate of savings. Since employment is expected to rise by about one million this year, while wages inch upward, consumer spending should expand. Consumers' propensity to put their earnings into goods and services rather than savings depends overwhelmingly on the prevailing attitude about the job outlook, which is conditioned by over-all employment opportunities. In turn, the job market rests on the level of over-all demand from others in addition to consumers: business, government, and foreign buyers. The recent growth in consumer credit is another reflection of the rising optimism of shoppers about their financial position this year (Compass Point 33).

There is one awesome aspect to the enlargement of consumer purchasing power. As incomes grow, the share devoted to discretionary spending (beyond the basic creature comforts) gains considerably. Since this discretionary spending is devoted primarily to postponable purchases, a large segment of potential buying may shift rather easily with the winds of consumer attitudes about job prospects.

***The 1954 "adjustment" was reflected in the sales of most manufacturers. For 1955, sales of machinery seem likely to be sustained by a high rate of investment in cost-reducing equipment. Textiles began to emerge from the low point on the usual two-year production cycle toward the end of 1954 and a further rise is anticipated. Textiles producers continued to feel the inroads of synthetic fabrics; synthetics were estimated to comprise 20 per cent of all fabrics consumed in 1954; the proportion is expected to rise to 40 per cent by 1975. Weakness in the coal industry was offset by strength in petroleum; in 1954 bituminous coal output was the smallest since 1881.***

## *The Experts Say . . .*

**TUBELESS TIRE production in 1955 will amount to about 55 million tires, about five times the output in 1954.**—*Joseph H. Hoban, vice president, B. F. Goodrich*

**STEEL production in 1955 should rise to 95-100,000,000 tons; that would make 1955 one of the four best years the steel industry ever had. The amount of steel ingots actually used in 1954 was about 96 million tons, but production was only a little over 88 million tons. The difference represented a substantial reduction in inventories of steel held by manufacturers. There is a good possibility that steel inventories will be increased in 1955.**—*W. W. Sebald, President, Armco Steel Corp.*

**Sales of PAINT, VARNISH, AND LACQUER in 1955 will probably be 3 to 5 per cent higher than in 1954.**—*National Paint, Varnish, and Lacquer Association.*

**Present indications are that PASSENGER CAR production in 1955 (5.5 million) will be higher than in 1954 with the production of TRUCKS AND BUSSES at least equal to the 1954 output. This should mean a 1955 production exceeding the 6.5 million motor vehicles produced in 1954.**—*L. L. Colbert, President, Chrysler Corp.*

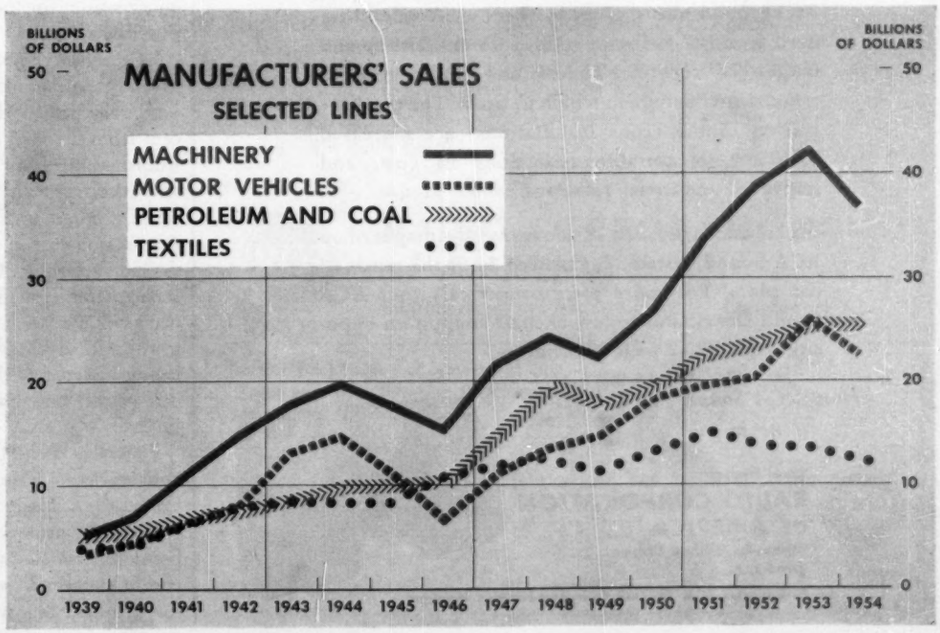
Private capital expenditures, a highly volatile sector of the economy which exerts considerable leverage on general business activity, is composed of three virile variables: new construction, producers' durable equipment, and business inventories. When equipment expenditures and inventory buying fell moderately last year, the decline was partly offset by the rise in construction, the most robust segment of the economy (Compass Points 18 and 19).

The U. S. Departments of Labor and Commerce anticipate a rise of 7 per cent in total construction this year, bringing the total to about $40 billion, a new all-time high. For a detailed breakdown of this growing market, see "Sales and Distribution" on page 93.

### *New Billions for Building*

The building of new non-farm dwelling units (homes and apartments) will run slightly short of the rate of new family formation of 1.5 million, since old families are dissolved by death while about 10 per cent of the new families live with in-laws.

However, new homes in 1955 are widely expected to equal or surpass the all-time high of 1.4 million new units reached in 1950. Last year was the second-best year; 1.2 million new homes were constructed. In December 1954, when more new homes were started than in any other December on record, construction was at the annual rate of 1.5 million units. Residential



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building should continue to reflect the Government's measures to ease credit and enable wage earners to own their homes.

Since it began to decline in the last quarter of 1953, business spending on plants and equipment has added to the downward movement of general business. From an all-time peak of $28.92 billion (annual rate) in the third quarter of 1953, these expenditures have slipped to about $26 billion at the present time and are expected to dip gently throughout 1955. This down-drag on the economy would be at a slower rate than in 1954.

During a period of recession, some of the most violent fluctuations are in plant and equipment expenditures. However, during the recent dip, the decline in this sector was only about on a par with that in total industrial production. The spread of automation, tax revision, and attempts to cut costs by modernizing facilities will continue to exert sustaining force on the spending for plants and equipment.

### *Inventory Stability*

Little variation is anticipated in total business inventories during 1955. This would be a sustaining factor in contrast with the role of inventories during Fall 1953–Fall 1954 when the decline of $4 billion in stocks did so much to tip the entire economy downward. Should inventories continue the rise which has been evident for four months, an expansion in the market would develop.

In early December total business inventories amounted to $78.7 billion, reflecting a decline of 6 per cent from the level of a year before. Information from manufacturers and merchants in 140 cities in 46 states pointed to a further better-than-seasonal rise in inventories during December. Considering seasonal patterns, manufacturers' new orders have been outpacing the growth in inventories, thus diminishing discernibly the apprehension over stocks and leading to further inventory boosts.

Federal expenditures for goods and services in fiscal 1955 are expected to be about $1 billion below those in the prior year. This should be more than counterbalanced by a rise in state and local expenditures for schools, highways, and other public improvements, so that this entire source of demand should be at least sustaining, in contrast to the situation in 1954.

The recent sharp rises in defense orders, which run several months ahead of expenditures, reflect the Administration's plans to reverse the sharp arms cutbacks which followed the end of the Korean clash in July 1953. In recent months, new orders for military needs have been about double those of a year before (Compass Point 31).

### *More Production Ahead*

One of the most closely watched indexes and the one by which manufacturers often gage their performances, the Federal Reserve Board's index of industrial production is widely expected to regain in 1955 all the ground lost since June 1953 when output tipped 136 (1947–1949 = 100). While a new post-war high is widely anticipated, it is beyond the consideration of even the most obdurate optimists to insist that a new all-time high—output reached 144 in October 1943—will be attained. Preliminary information pointed to an index of 130 in January (Compass Point 16).

The most lively upward thrust should develop, at least for the first half of the year, in those industries —steel, automobiles, machinery, defense materials—where the inventory declines were the sharpest during 1954. This was already evident in January.

Assorted experts and industry leaders look for steel output to range somewhere between 95 and 112 million tons this year. The all-time high of 111.6 in 1953 still stands as the peak; 1954's production amounted to 88 million tons.

Steelmaking in January was the highest since November 1953 when the slide began. While the automakers continued as the most avid and substantial buyers of steel, many other steel consumers also placed orders. Steel consumption by the automobile industry probably amounted to about 25 per cent of all steel output last month in comparison with the usual rate of 20 per cent. Some steel users were spurred by the coming wage negotiations which could result in a strike or a price rise.

With the competitive race gathering momentum, auto manufac-

turers produced more cars in early January than at any time during the previous four-and-a-half years. Since the current rate of output is considerably higher than the anticipated annual total of 5.8 million passenger cars, a sharp decline in the second half of the year seems likely. Some observers thought that the current high output was really borrowing from sales which might ordinarily have come in the Spring and Summer. Since the current market for new cars is remarkably receptive—more new cars (573,000) were sold in December 1954 than in any December on record and almost as many as in October 1950 (580,000), the best month ever—many makers are rushing to cash in on the shoppers' spending mood.

### *Providing New Jobs*

Like an unwelcome guest at a wedding, the specter of increasing unemployment hovers behind the promising pronouncements of many economic experts. Since the labor force increases about 600,000 each year while industrial productivity rises about 3 per cent, many are the worries, usually unvoiced, about the creation of the needed new jobs each year (Compass Points 3-6).

However, two other variables are sometimes overlooked: population expansion and rising living standards. A rise in the number of jobs should produce the extra output for a population which increases by nearly three million each year. In addition, the rise in the non-working segments of the population—children and oldsters—is noticeably faster than that of the population as a whole. Meanwhile, the steadily growing productivity should be absorbed in the rising living standards of a population which measures each year's success as it surpasses the prior one. Productivity is frequently translated into better living standards through lower prices for many consumer goods.

Variously viewed as ranging from 2.5 million to as much as 5 million this year, unemployment would most likely impel Federal action were it to stay above 3.5 million for a few months. Preliminary information on joblessness in January pointed to a slight rise above the 2.8 million of the prior month.

While most price indexes were placid during the past year, it in no sense follows that most prices were lethargic (Compass Points 7-9). The placidity was much more the result of divergent price patterns, which managed to offset one another, than it was of individual price stickiness. Farm products as a whole are now about 6 per cent cheaper than they were a year ago—meats are down 11 per cent—while non-farm products are about even with a year ago. Rubber and tea zoomed upward 70 per cent from a year ago, egg prices fell about 30 per cent, zinc gained 14 per cent, and steel scrap spurted 10 per cent.

Most economists expect little variation in 1955 since the upward pressure of augmented demand should be offset by increased imports and excess productive capacity. The prices of manufactured goods will most likely swell slightly if aggressive union demands succeed.

Scattered reports from several cities indicated that business men last month were encountering less difficulty and fewer delays with their collections than during recent months. Manufacturers and wholesalers had less trouble collecting their accounts than did retailers who still had to extend liberal credit terms to entice shoppers.

As always, the American economy in the early part of 1955 was composed of divergent patterns. But in contrast to the situation a year earlier, some of the key factors were pointing upward: defense orders and inventories. Among the many stimulating factors were easy money policy, record levels of personal income and spending, the expanding population, superbooming construction, new industries, automation, increasing government expenditures for public works, and most basic of all, the pervading realization that the Federal Government is committed to act if a serious sinking spell develops. Among the areas displaying weakness were farm income and agricultural equipment sales, railroads, machine tools, shipbuilding, and coal.

Among the signals to watch in the months ahead:

February: Will the new job-seekers find work or will unemployment expand?

March: Will the Treasury refund its debt by long-term borrowing?

April: Will new car sales and prices skid?

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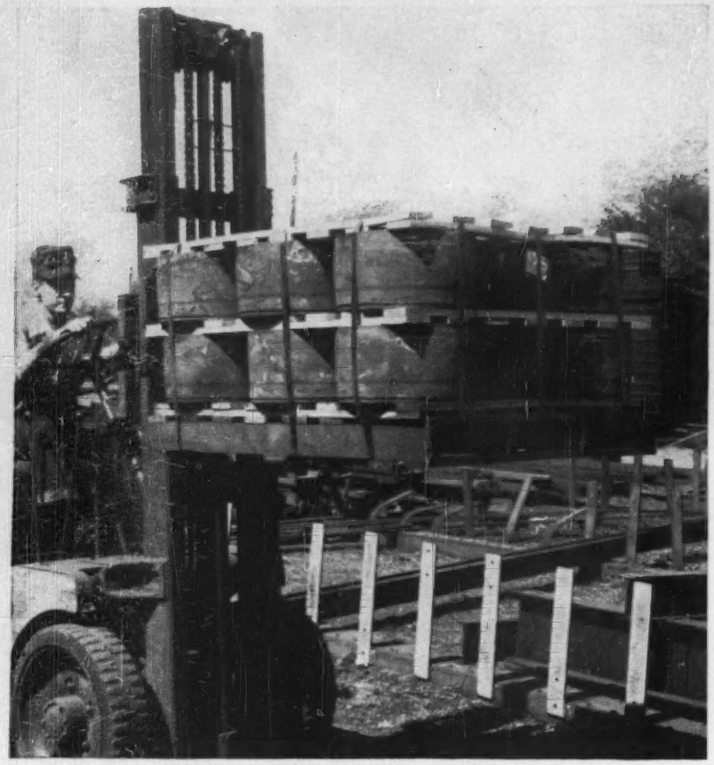


## Signode unitizing method speeds truck handling of heavy castings

A manufacturer in Alabama sought a safer, lower cost way to ship heavy-wheel castings by motor truck to Michigan. With the co-operation of Signode's fieldman, a special unitizing pallet pack was developed. First, a heavier, stronger pallet was built. Two layers of castings, separated by a wood frame, and similarly capped, were strapped to the pallet. Six bands of Signode steel strapping, spaced for maximum unitizing efficiency, were applied. The new method of shipping saved time in loading and unloading. Handling safety was greatly increased. Cost of the pallets was self-liquidating, because the receiver bought them for inplant handling and storing of castings, and for intraplant shipping.

*Get in touch with your Signode Fieldman!* He will be able to show you, too, how to make important savings in packaging, handling and shipping your products through the six basic unitizing methods. Quickest way to reach him is to write

**SIGNODE Steel Strapping Co.**

*2665 N. Western Ave., Chicago 47, Ill.*

Offices coast to coast—Foreign subsidiaries and distributors world-wide.
In Canada: Canadian Steel Strapping Co., Ltd., Montreal • Toronto


# *Failures . . .*

Business failures dipped slightly to 917 in December but were above the comparable level of a year earlier for the twentieth straight month. The total for 1954 was the highest since 1941 and was 25 per cent above 1953.

The failure rate in 1954 rose to 42 per 10,000 concerns listed in the DUN & BRADSTREET *Reference Book*, as shown by DUN'S FAILURE INDEX. While casualties occurred at about the same rate as in 1942 when there were 45 per 10,000, they remained considerably below the rate of 55 in 1941.

Concerns under five years old continued to predominate as failures. However, the percentage of total casualties in this age group has diminished gradually year by year from 78 per cent in 1947 to 57 per cent in 1954.

In all functions, mortality was heavier in 1954. Both construction and service had the most casualties on record in the last 21 years. Although the toll among manufacturers swung up sharply from the two previous years, it did not reach the 1949 level. Wholesaling and retailing failures edged up to postwar highs.

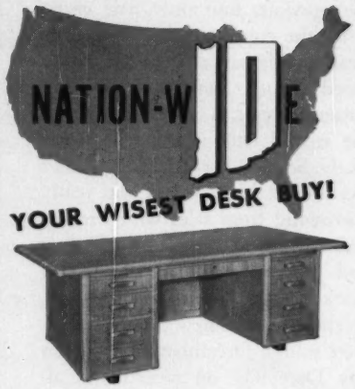
Manufacturing failures climbed

*Continued on page 35*

FAILURES BY DIVISIONS OF INDUSTRY

| *(Current liabilities in millions of dollars)* | Number 12 Months 1954 | 1953 | Liabilities 12 Months 1954 | 1953 |
|---|---|---|---|---|
| MINING, MANUFACTURING | 2,282 | 1,857 | 171.3 | 158.8 |
| Mining—Coal, Oil, Misc. | 42 | 41 | 8.0 | 3.0 |
| Food and Kindred Products | 179 | 165 | 16.1 | 22.4 |
| Textile Products, Apparel | 543 | 472 | 28.7 | 30.4 |
| Lumber, Lumber Products | 336 | 287 | 18.6 | 14.1 |
| Paper, Printing, Publishing | 129 | 107 | 12.3 | 10.7 |
| Chemicals, Allied Products | 75 | 60 | 5.6 | 7.3 |
| Leather, Leather Products | 103 | 98 | 6.9 | 7.1 |
| Stone, Clay, Glass Products | 60 | 39 | 2.2 | 2.1 |
| Iron, Steel, and Products | 115 | 66 | 10.4 | 12.0 |
| Machinery | 301 | 171 | 37.9 | 29.8 |
| Transportation Equipment | 51 | 60 | 5.9 | 6.2 |
| Miscellaneous | 348 | 291 | 18.7 | 13.8 |
| WHOLESALE TRADE | 1,132 | 933 | 56.3 | 52.2 |
| Food and Farm Products | 298 | 265 | 14.0 | 16.7 |
| Apparel | 46 | 38 | 1.6 | 1.2 |
| Dry Goods | 60 | 44 | 2.4 | 2.3 |
| Lumber, Bldg. Mats, Hdwre. | 113 | 103 | 5.0 | 9.3 |
| Chemicals and Drugs | 47 | 35 | 1.3 | 1.6 |
| Motor Vehicles, Equipment | 56 | 36 | 1.8 | 1.2 |
| Miscellaneous | 512 | 412 | 30.1 | 19.8 |
| RETAIL TRADE | 5,491 | 4,381 | 145.5 | 117.3 |
| Food and Liquor | 1,004 | 888 | 14.8 | 15.6 |
| General Merchandise | 192 | 149 | 7.0 | 4.2 |
| Apparel and Accessories | 808 | 597 | 15.2 | 15.2 |
| Furniture, Furnishings | 906 | 711 | 43.4 | 26.6 |
| Lumber, Bldg. Mats, Hdwre. | 311 | 221 | 9.8 | 7.2 |
| Automotive Group | 616 | 520 | 20.6 | 17.2 |
| Eating, Drinking Places | 985 | 793 | 18.7 | 17.5 |
| Drug Stores | 161 | 123 | 4.8 | 4.2 |
| Miscellaneous | 508 | 379 | 11.1 | 9.6 |
| CONSTRUCTION | 1,305 | 1,024 | 56.8 | 43.3 |
| General Bldg. Contractors | 456 | 382 | 29.8 | 21.5 |
| Building Subcontractors | 793 | 582 | 23.7 | 16.1 |
| Other Contractors | 56 | 60 | 3.4 | 5.7 |
| COMMERCIAL SERVICE | 876 | 667 | 32.7 | 22.5 |
| TOTAL UNITED STATES | 11,086 | 8,862 | 462.6 | 394.2 |

Liabilities are rounded to the nearest million; they do not necessarily add to totals.


• Coast to coast . . . cost for cost . . . you're always sure of a good desk buy when it bears the "ID" trade-mark. That's because all Indiana Desks are fashioned of extra-good wood. All are finished to assure lasting good looks. In all ways, your wisest investment for work-and-cost-saving values!

Wherever you do business, whatever your desk needs, a visit to your nearest Indiana Desk Co., Inc., dealer will prove profitable indeed. Write for his name right now!

*indiana desk co., inc.*
JASPER, INDIANA • U.S.A.
OUR 50TH YEAR OF SERVING AMERICAN BUSINESS

## Low-cost case marker saves thousands of $

*...pays for itself in weeks*

**Gottscho ROLACODER Marker attaches to conveyor or case-sealer**

Now you can do away with that costly extra operation for manual rubber-stamping or stencilling of code-dates, lot numbers, contents descriptions, etc. on cases . . . or reduce big inventories of completely printed cases . . . and save thousands of dollars annually. Use an inexpensive ROLACODER machine to mark your cases automatically on the production line. Compact, precision-made ROLACODER is friction-operated, self-inking—makes single, accurately located imprint on each case to register with other copy. Uses quick-change rubber type or dies, holds 8-hour ink supply. Different models available to imprint top, ends, sides of small or large boxes, cartons, cases, other packages.

*Write for descriptive literature*

Gottscho **ADOLPH GOTTSCHO, INC.**
**Dept. H, Hillside 5, N. J.**

*Automatic Coding, Marking, Imprinting Machines*
In Canada: RICHARDSON AGENCIES, LTD., Toronto & Montreal

**NEW 'WINDLITE' BY RONSON** just out and already America's most talked about windproof lighter. New owners proudly show off the Windlite—and with it, your company's name, trademark, or brief advertising message. Retail value...$3.95

## First time ever...*complete Ronson line of prestige business gifts...widest price range*

You'll put your company's name in the best light, when you put it on a Ronson lighter. Many times a week...thousands of times a year...your name, trademark or slogan will be displayed. And every time, Ronson quality and prestige will proclaim your good taste and your insistence on the best. No other lighter...no other name in gifts...has won such public recognition and regard.

***Special! Limited quantity of New Ronson Electric Shavers now available! The ideal business gift!***

Now for the first time you can choose appropriate business gifts, service awards, safety awards, premiums, from a wide range of Ronsons with retail values from $3.95 to $200.

Certainly you'll want to see the Ronson line...hear about the liberal price structure...learn about the finest engraving and decorations. Mail coupon and we'll be happy to give you the facts.

*world's greatest lighter* **RONSON** *world's greatest business gift*

Ronson Corporation
Industrial Division
31 Fulton St., Newark 2, New Jersey
DR–2

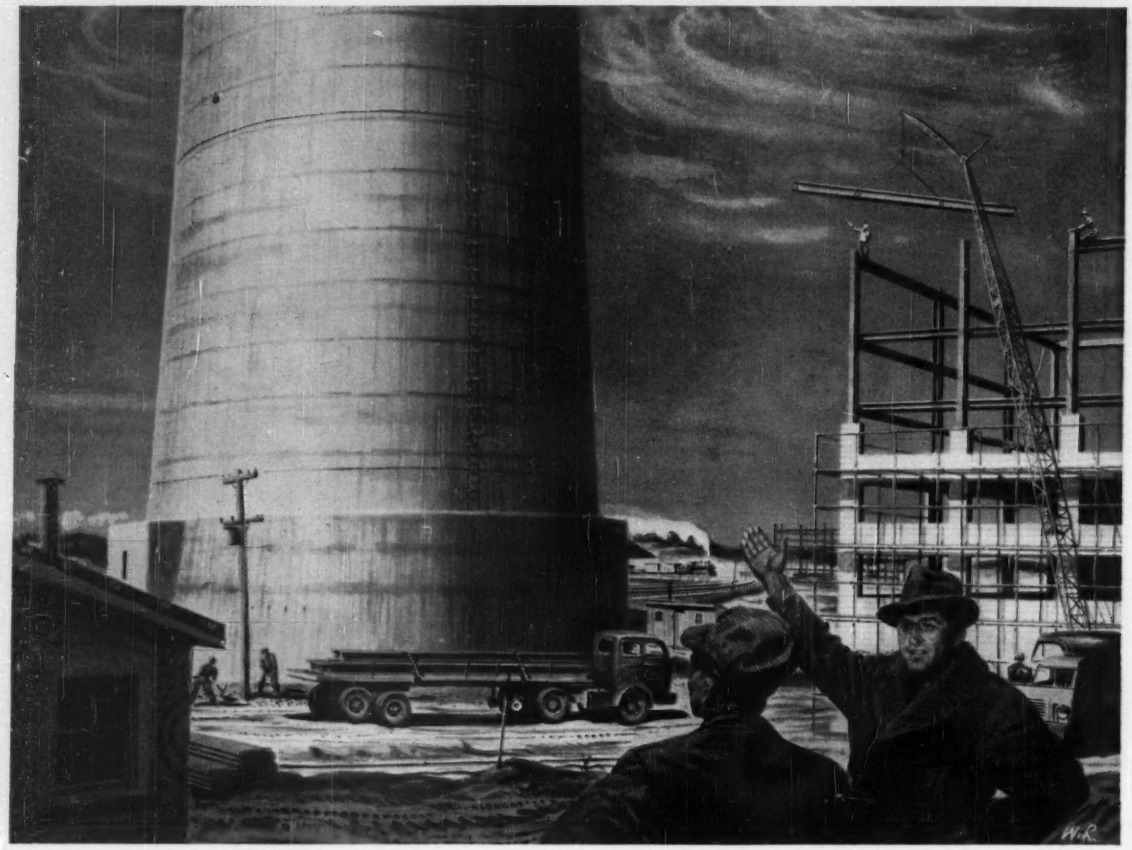
*I would like complete information on Ronson lighters for business gifts.*

name _____

company _____

street address _____

city & state _____



**Now well underway,** this huge Inco recovery plant near Copper Cliff, Ontario, has the tallest smelter chimney in the world; its stainless steel cap is 637 feet above the ground.

# Soon...iron from a Nickel mine!

## Pioneering new Inco process will add 1,000,000 tons a year to North America's high-grade iron ore resources

There's *good* iron in nickel ore. Iron to make premium-grade open hearth ore for the steel plants of North America. Lots of it!

For years, all over the world, iron from nickel ore has been wasted in slag or tailings. No one had found out how to extract this iron economically.

Now, after years of laboratory and pilot plant study, International Nickel Company has solved the problem with its new atmospheric pressure ammonia leaching process.

### Building huge, new plant!

As a measure of the promise of this new process, International Nickel is putting $16,000,000 into the first unit of a huge new plant.

The equipment to be used is truly gargantuan requiring some of the largest machines of their types in the world. And the production potential of this Inco-made, miniature Mesabi is 1,000,000 tons of iron ore a year. *The highest grade iron ore ever produced in quantity on the North American Continent!*

### Many recent Inco advances in extraction metallurgy!

Copper-nickel separation by matte flotation! Oxygen-flash smelting of copper concentrates! And now, iron from nickel ore! *All part of an improvement and expansion program that will cost over $200 million. These outstanding advances reflect International Nickel's continuing interest in stepping up production, in keeping costs down through maximum utilization of ores.*

**"The Romance of Nickel"** makes interesting reading for any executive. Write for a free copy of this 56 page book. The International Nickel Company, Inc., Dept. 81d, New York 5, N. Y.

© 1955, T.I.N.Co.

**INCO International Nickel**

*Producer of Nickel, Inco Nickel Alloys, Copper, Cobalt, Tellurium, Selenium and Platinum, Palladium and Other Precious Metals.*

**RARE BIRDS WE HAVE KNOWN**

**THE RUFFLED GROUCH**

*This fellow—the Ruffled Grouch—is rather difficult to spot. Best place to look for him, however, is in any office not using M & V Carbon Papers. When typists do use M & V, their carbon copies are so clean and easy to read that a Grouch has very little to get ruffled about. And before long, he isn't even grouchy. As a consequence, unless you have a special liking for this bird, you'd be smart to ask your office supplier for M & V. For a free print of the "Grouch" (suitable for framing), plus samples of M & V Carbon Papers, write to Mittag & Volger, Inc., Park Ridge, N. J.*

M & V **CARBON PAPER AND INKED RIBBONS**

notably higher: over 70 per cent, in the iron and steel and machinery industries, and 54 per cent in the stone, clay, and glass line. More machinery concerns succumbed than in any of the other 20 years on record. Only one manufacturing industry, transportation equipment, had fewer failures than in 1953.

No exception to a general upward trend appeared in any wholesale or retail trade. The most notable wholesale increases lifted the tolls in dry goods and automotive lines to post-war highs. In retailing, food stores showed the smallest relative rise in casualties, while furniture, appliance, and furnishings stores failures rose considerably to a new record high.

Failures increased in 1954 in all nine regions. A marked rise appeared in the East North Central States, in the South Atlantic States, notably the District of Columbia, Maryland, Virginia, and South Carolina, and in the Mountain States where Arizona's toll was up appreciably and Nevada's was about four times as heavy as a year ago. While a number of areas did not have as many casualties as in earlier post-war years, the South Atlantic, Middle Atlantic, West South Central, and Mountain States reached post-war highs in 1954, and the Pacific toll continued upward to a new record for the 21-year period of regional tabulation.

THE FAILURE RECORD

| | Dec. 1954 | Year 1954 | Year 1953 | P.C. Chg.† |
|---|---|---|---|---|
| DUN'S FAILURE INDEX* | | | | |
| Unadjusted | 40.3 | 42.0 | 33.2 | +27 |
| Adjusted, seasonally | 42.9 | | | |
| NUMBER OF FAILURES | 917 | 11,086 | 8,862 | +25 |
| NUMBER BY SIZE OF DEBT | | | | |
| Under $5,000 | 152 | 1,640 | 1,383 | +19 |
| $5,000–$25,000 | 437 | 5,640 | 4,317 | +31 |
| $25,000–$100,000 | 250 | 2,946 | 2,375 | +24 |
| $100,000 and over | 78 | 860 | 787 | + 9 |
| NUMBER BY INDUSTRY GROUPS | | | | |
| Manufacturing | 204 | 2,282 | 1,857 | +23 |
| Wholesale Trade | 98 | 1,132 | 933 | +21 |
| Retail Trade | 413 | 5,491 | 4,381 | +25 |
| Construction | 130 | 1,305 | 1,024 | +27 |
| Commercial Service | 72 | 876 | 667 | +31 |
| | (*LIABILITIES in thousands*) | | | |
| CURRENT | $40,103 | $462,628 | $394,153 | +17 |
| TOTAL | 40,925 | 469,611 | 400,467 | +17 |

*Apparent annual failures per 10,000 listed enterprises, formerly called DUN'S INSOLVENCY INDEX.
†Per cent change, Year 1954 from Year 1953.

BUSINESS FAILURES *include those businesses that ceased operations following assignment or bankruptcy; ceased with loss to creditors after such actions as execution, foreclosure, or attachment; voluntarily withdrew leaving unpaid obligations; were involved in court actions such as receivership reorganization, or arrangement; or voluntarily compromised with creditors out of court.*

CURRENT LIABILITIES, *as used in the Failure Record, have a special meaning; they include all accounts and notes payable and all obligations, whether in secured form or not, known to be held by banks, officers, affiliated companies, supplying companies, or the Government. They do not include long-term, publicly held obligations. Offsetting assets are not taken into account.*

**MARKEM SOLVED THIS MARKING PROBLEM**

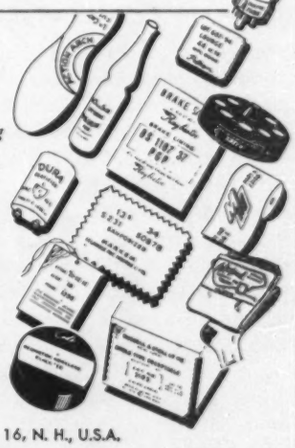
***IMPROVED PRODUCT APPEARANCE —LOWER PRODUCTION COSTS***

A manufacturer of wood screws increased his product's retail merchandising appeal by changing from cardboard boxes to plastic tube containers which clearly display the screws. He now prints all label data directly on the cylindrical container with a Markem machine. Quickly changed variables in imprints include: quantity, type of plating, head type, length and size. Containers are imprinted as and when needed; no inventory of marked containers need be maintained. The method eliminated outside printing changes, tremendous paper label inventories, and labor of label application. One Markem machine, printing at production rates in exact quantities, has made possible the more attractive and appealing package and at the same time reduced production costs appreciably.

**THE MARKEM METHOD CAN HELP YOU**

*This is just an example of how Markem solves industry's marking problems. The complete Markem Method consists of: (1) ANALYSIS of your marking or imprinting problems, (2) RECOMMENDATION of appropriate Markem Machine, Markem Type and Markem Ink, and (3) SERVICE — in installation, instruction, maintenance and supply.*

*If you want to mark products, parts or packages for identification, control or market, get in touch with Markem. The Markem Method has been providing a single source for savings in time, effort and inventory . . . since 1911.*



Markem Machine Company, Keene 16, N. H., U.S.A.

**MARKEM ...TO MAKE YOUR MARK**

G. Washington

THE LAST PAGE OF HIS
FAREWELL ADDRESS

92

himself for future generations. —

Relying on its kindness in this as in other things, and actuated by that fervent love towards it, which is so natural to a man, who views in it the native soil of himself & his progenitors for several generations. — I anticipate with pleasing expectation that retreat, in which I promise myself to realize, without alloy, the sweet enjoyment of partaking, in the midst of my fellow citizens, the benign influence of good laws under a free Government — the ever favorite object of my heart, and the happy reward, as I trust, of our mutual cares, labours and dangers.

United States } G. Washington
19th September } 1796

Conclusion of the Address
Bread given me by my Father
on the day he died. —

FAC-SIMILE PAGE
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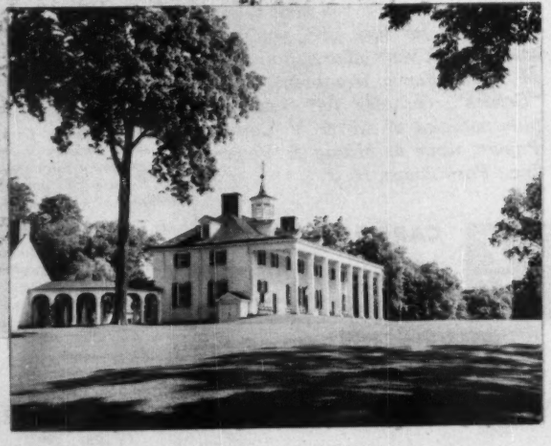
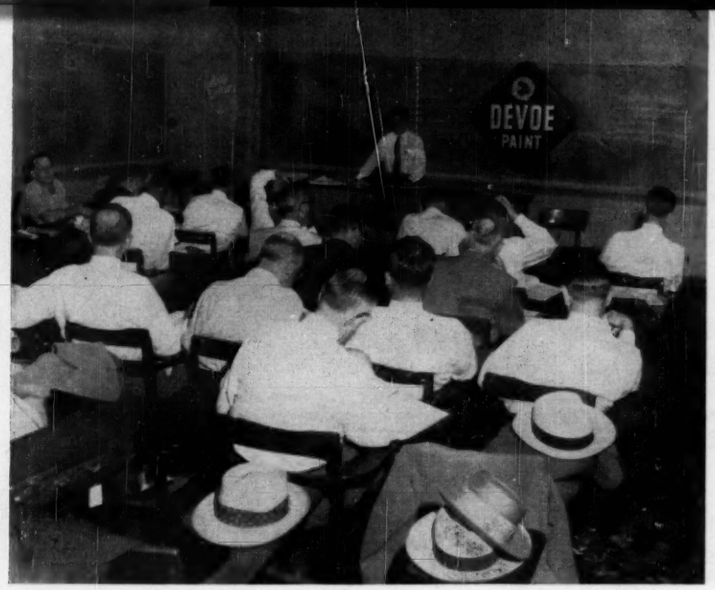
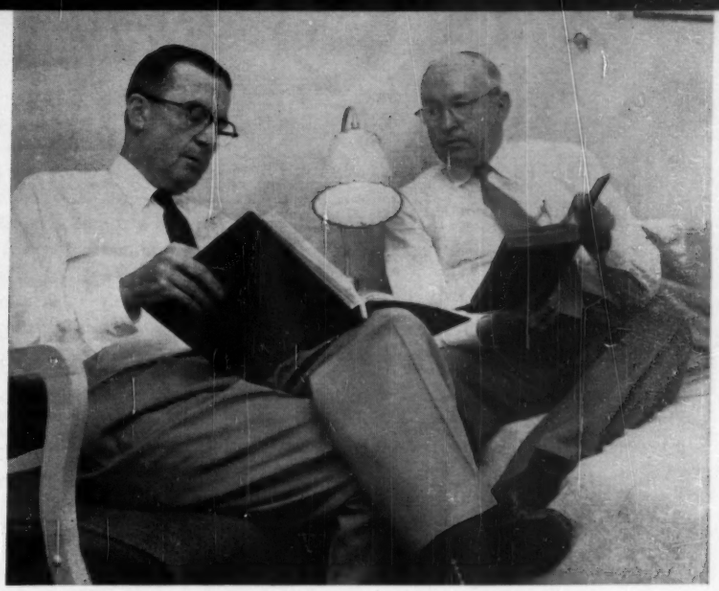
DRAWING
BY HOWARD SLOANE ZOLL

MOUNT VERNON PHOTOGRAPH
BY LOUIS C. WILLIAMS





IN THE CLASSROOM AND IN LIVING QUARTERS, EXECUTIVES STUDY AND DISCUSS MARKETING PROBLEMS AND SOLUTIONS THAT MAY HAVE PARALLELS IN THEIR OWN INDUSTRY.

EXECUTIVE DEVELOPMENT is a prime consideration of all progressive companies these days, but high costs may be forcing smaller companies to forgo such plans. Here is one program designed for large or small budgets; its particular objective was keeping executives fully aware of changing marketing conditions.

# *Executive Development*
## ECONOMICALLY TAILORED

J. HAROLD KOLSETH
***Executive Vice-President, Devoe & Raynolds Company, Inc.***

THERE is to-day an executive training need that is not being effectively met. The development of executive operating talent at the "so-called" middle-management level is currently possibly one of the most important, and yet one of the most neglected, areas in manpower training.

We recently conducted an experiment in training which may suggest a practicable and economical approach to this problem. Our program might be styled "Do-It-Yourself" executive development because it is adapted to in-company use by both small and large companies and, perhaps even more important, because the executive student learns from the course a technique whereby business publications and the daily changing distribution pattern around him can become the basis of his own continuing case method study.

There are a growing number and variety of executive development training plans. The objective of such programs is often to prepare a proven specialist for new and broader responsibilities. In addition, however, there is a growing need to foster the latent ability of the individual manager to develop in his present job responsibility and adapt himself to fast-changing conditions.

Before a divisional product or sales manager can effectively meet changed conditions he must be receptive to change itself. Here is where a serious and sometimes vital management mistake is made—seeking to impose new methods and new products on personnel not yet properly conditioned to the new needs of a changing market. Therefore, early in our Sales Management Forum, we established an underlying theme best summarized as a *"Triple A Approach"* to problems confronting many companies to-day in the merchandising and distribution of their products.

*Awareness of basic changes* which are continually taking place in both the markets we endeavor to sell and the products we offer to that changing market. Changes in the characteristics, location, and distribution of a growing population require constant study by manufacturers who want to make the most of the new, larger market opportunities; otherwise, how can efforts and manpower be directed to the most productive markets and areas? In 168 metropolitan areas (only 9 per cent of the country's counties) there is more than half of the country's population and almost two-thirds of the total retail volume. It must also be recognized that suburban areas have grown three times as fast as central cities, that 60 per cent of the country's population have moved within the last eight years, and that there are now predictions of 195 million population by 1965. All this means continuing change.

*Advanced methods* are being devised, tested, and applied every day by successful companies to anticipate and successfully surmount the market and product changes forced upon them. Obviously advanced methods are often changed methods which involve many personnel and operating adjustments.

*Action.* Once a company becomes aware of the scope and meaning of market and product changes and devises advanced methods to counteract or adapt to them—then almost automati-

TRANSLITERATION
PAGE 78

cally a program for action and change becomes feasible and mandatory. Only when that point of view becomes established are constructive changes welcomed.

The purpose and framework of the Sales Management Forum can perhaps be best understood from the following announcement as included with the invitation to 22 of our company's top divisional and district sales executives:

"Devoe & Raynolds Company in its 200th year will conduct a Sales Management Forum at the University of Louisville during the last week of August. The program will not use University faculty but is arranged to include outstanding technical representatives and outside speakers as well as a full cross-section of the company's top management team. Major emphasis will be on comprehensive marketing discussions based on actual current policy situations faced by selected companies. The objective of the group discussions is to place these problems before men who have a wide range of experience so that they can bring their own experience to bear on the case discussions."

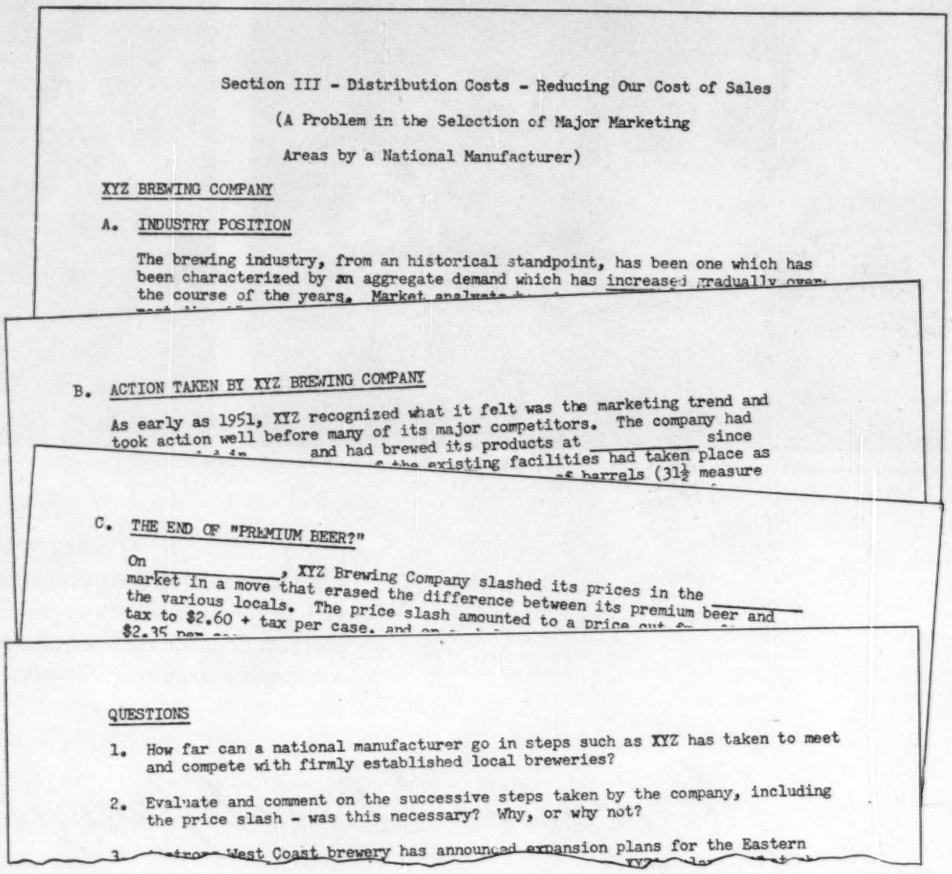
The bulletin then went on to describe the objectives of the Forum and other pertinent information such as the method of instruction and discussion and the arrangements made to take care of the personnel attending.

Three objectives were listed: (1) "Analysis of current methods employed in the selection, training, supervision, and motivation of salesmen"; (2) "The appraisal of actual effective sales management techniques used by other companies to meet changing markets"; and (3) "Reduction in distribution costs by carefully evaluating expenditures in the doubtful or unproductive categories, singling them out and eliminating them."

The "Case Method" was to be used with the object of "forcing the students to define the major elements of a problem, analyze practical alternatives, participate in group discussion, and contribute toward a feasible solution." Cases were selected from challenging marketing and sales management policy problems covering twelve different industries outside, but parallel to, the paint industry. Four cases were included in the first session with the added note that, "In case study there is no single answer—the principal value lies in your power to analyze the case and come to a sound judgment and decision on the facts as known."

It was further noted in the bulletin that the Forum was an experiment designed to supplement outside training courses and that it was directed toward marketing policies. If the results were found to be successful, the Forum would be repeated and expanded for later sessions.

During the last day's session the men were called upon to submit an unsigned critique including a frank opinion on the value of the Forum as applied to their own most pressing marketing problems, and constructive suggestions for improving the meeting. These opinions



Section III - Distribution Costs - Reducing Our Cost of Sales

(A Problem in the Selection of Major Marketing Areas by a National Manufacturer)

XYZ BREWING COMPANY

A. INDUSTRY POSITION

The brewing industry, from an historical standpoint, has been one which has been characterized by an aggregate demand which has increased gradually over the course of the years. Market analysts

B. ACTION TAKEN BY XYZ BREWING COMPANY

As early as 1951, XYZ recognized what it felt was the marketing trend and took action well before many of its major competitors. The company had and had brewed its products at since existing facilities had taken place as barrels (31½ measure

C. THE END OF "PREMIUM BEER?"

On , XYZ Brewing Company slashed its prices in the market in a move that erased the difference between its premium beer and the various locals. The price slash amounted to a price cut

QUESTIONS

1. How far can a national manufacturer go in steps such as XYZ has taken to meet and compete with firmly established local breweries?
2. Evaluate and comment on the successive steps taken by the company, including the price slash - was this necessary? Why, or why not?
3. West Coast brewery has announced expansion plans for the Eastern

*Case histories for use in the week's study were selected and prepared from material currently appearing in trade and business publications. All pertinent information concerning the problem and company's solution is given, including industry description and past and present operations of the subject company.*

were in turn made the subject of group discussion—in effect, therefore, the Forum was made a case study before the group. Without exception all men in attendance indicated that they had acquired new concepts from the problems and experiences of other industries.

The most interesting suggestion was that any future Forums, if held, should be expanded to include more manufacturing representatives, as well as research, financial, and administrative personnel. This would be of value in bringing into focus the interdependence of all departments of a company in any general sales plan.

The lessons and results learned from this experiment in do-it-yourself executive development were:

1. To make effective a short-term Forum requires careful preparation and planning. The easiest error would be to undertake a too ambitious or too diversified agenda. Because we concerned ourselves only with realistic case problems designed to assist executives in improving their present job responsibility, effective group participation was assured.

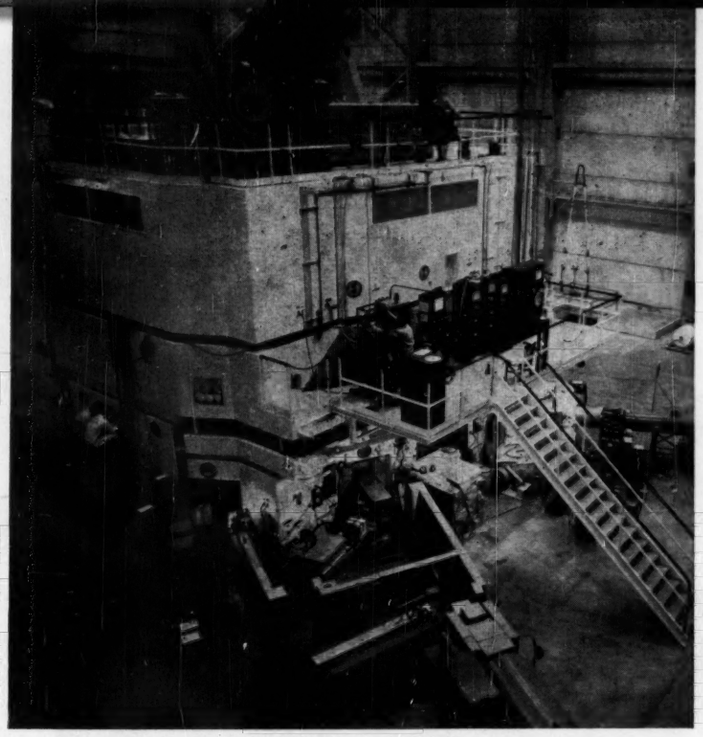
2. The case study method deserves its growing popularity and should be given more serious consideration for in-company training. By participating in many realistic situations the executive student can acquire, in a relatively short time, a wide variety of concentrated parallel experiences which serve to broaden his perspective. The student discovers the complexity of each management decision, interdependent relationships, and the many implications to be considered in various courses of action.

The case approach makes it apparent that abstract principles and the fixed formula are secondary to the executive's personal skill in analyzing, appraising, evaluating, and handling each situation on an individual basis. This type of training, once consciously learned, can be invaluable.

3. A collateral benefit to top management also emerged. The meetings were a middle-management team in action, in unconscious competition with each other in demonstrating their relative skill in diagnosing problems and selling their ideas to the group at large. This could be of value in appraising men for promotional opportunities within the company.

4. The participating executives concluded that this do-it-yourself Forum is a practicable framework which should be further improved to meet a current executive training need; from a company standpoint the method is sound and doubly economical because the cases can be tailored to parallel current industry and company

*Continued on page 76*



**Neutrons and gamma rays** play hob with many common materials. This reactor, operated for the AEC by Phillips Petroleum Company was specifically designed to test materials for the atomic age.

**What changes must be made in product design to meet the needs of the atomic age? What new materials must be used? The atomic market will be a big one some day—and a rewarding one. But it calls for new formulations and new fabrication methods—and plenty of hard work. This article, the second of two, points up the technical problems and shows how they're being solved. You'll meet familiar items in a different setting; and brand-new materials that may prove useful for products now sold to other fields.**

# *Fitting your product to the atomic age*

## PART II: MATERIALS AND DESIGN

ANNESTA R. GARDNER
*Industrial Editor*

CAN you build a pump for molten metals that will operate continuously for a decade or more without leaking and without contaminating the material it handles?

Is your plant equipped to form, weld, and assemble such new and temperamental materials as zirconium, titanium, and vanadium?

If so, you're all set for the atomic age.

It is not necessary to meet all these conditions to sell the atomic market. There are plenty of opportunities for established products (see January, page 36). But the requirements for nuclear reactors (atomic piles) and radiochemical process equipment are so unusual and vital that it's well worth taking time to examine them.

As Stuart McLain of Argonne National Laboratory points out, reactor builders must cope with two of the most difficult problems ever encountered—corrosion and neutron radiation damage—and at the same time must meet unbelievably high standards of structural strength and durability. Yet, they are barred from using many of the common materials of construction by the special nuclear requirements and radioactivity problems of reactors themselves.

Small wonder that engineers have ranged the alphabet from aluminum to zirconium, and combed the periodic table of elements, looking for materials that can meet these strange new demands. They haven't turned up any "Superelements." But they have found a number of materials that can and do serve. Outlined on page 43 are a score of these, and some of the important jobs for which they now seem fitted.

Basically, an atomic reactor is not a complicated device. It is just a machine like a furnace or engine which produces energy and a number of by-products.

In the atomic engine, energy is produced by virtue of a nuclear "chain reaction" in which tiny particles—neutrons—released by one group of atoms hit other atoms and break them up into fragments, releasing more neutrons and generating energy in the form of heat. Large amounts of gamma radiation (similar to X-rays and even more potent) are also produced.

Like an automobile engine or Diesel, a nuclear reactor requires structural materials, fuel, and coolants. It needs a housing or shield, and it needs a "brake" or control mechanism.

In the nuclear reactor, uranium and plutonium are fuel sources; air, water, liquid metals, or the fuel mixture itself may be used as coolants; and the structural materials range from familiar metals like stainless steel and aluminum to such "new" ones as vanadium and zirconium.

The housing or shield can be made of such relatively inexpensive materials as iron and concrete, built into thick walls which will reflect and absorb radioactivity so that it does not endanger operating personnel. And the braking mechanism is just a set of steel rods containing a small percentage of an element like boron, cadmium, or hafnium which will absorb neutrons and, in effect, damp the furnace flame.

In some reactors, a moderator is also needed —to slow neutrons down so they are more readily captured. Materials used for this purpose include graphite, beryllium, and water.

The big problems posed by nuclear reactors do not, then, lie in their basic concept, but rather in the fact that they use a brand-new kind of fuel which presents a number of requirements that simply have not been encountered before.

For instance, to keep the reaction going, it is very important that the materials used in building the equipment do not sponge up these neutrons and keep them from their appointed task of splitting the sensitive or *fissionable* atoms. This means reactor materials (except, of course, the control rods) must have low neutron absorption factors (neutron capture cross-sections). They must also be extremely pure. Percentages of impurities which would hardly be noticed in other types of equipment can soak up so many neutrons that they shut down a reactor completely, or pose radioactivity problems so acute as to endanger operating personnel.

Radiation damage—by gamma rays as well as by neutrons—also causes plenty of trouble in reactor design. Metals stand up quite well, though changes in hardness, strength, and ductility have been observed. But most organic compounds do not. The effects of radiation on the softer materials—thermoplastics, rubbers, greases —are particularly severe.

This means that ordinary lubricants, seals, packings, and insulation can not be used inside reactors; and may not prove serviceable even

*Continued from page 39*

for auxiliary equipment like primary heat-exchangers and radiochemical processing units.

If these will not serve, what will?

The situation is not nearly as bad as it might seem. There are quite a few alternates.

In instruments, for example, V. P. Calkins of the General Electric Aircraft Nuclear Propulsion Department suggests that inorganic materials like mica and ceramics may take the place of organic dielectrics. Metal gaskets and seals can substitute for leather and rubber. Solid lubricants like molybdenum disulfide may serve as alternates for petroleum products.

Some of the hard plastics—notably the mineral-filled phenolics—have been found quite satisfactory for auxiliary equipment like remote-control manipulators, though they can not be used inside reactors. Indeed, phenolic laminates are among the few materials accepted for use in such equipment by Argonne National Laboratory. (The others: aluminum, stainless steel, *Elgiloy*.)

It should also be noted that one group of thermoplastics—the fluorine polymers—is playing an indispensable rôle in atomic energy production, in preparing uranium for reactor use. Here, the radiation level is not high, but corrosion is an acute problem, and these plastics are almost the only materials that can take it.

One of the most interesting and encouraging things about reactor design is the fact that many of its problems are encountered in other fields like high-temperature chemical processing, electronics, and jet propulsion. Solutions found for one may well provide answers for the others.

For instance, transistors and other new electronic devices also require extremely high-purity materials. The germanium and silicon used in these devices must have a controlled purity on the order of 99.9999 per cent. So, research by organizations like Bell Telephone Laboratories on these metals may well turn up techniques that are applicable to reactor materials.

Likewise, as Hans Thurnauer, vice-president and research director of American Lava Corporation, points out, work on ceramic-type materials for jet engines and high-temperature furnaces may supply new oxides, borides, and carbides for use as reactor fuel elements, moderators, reflectors, and shields.

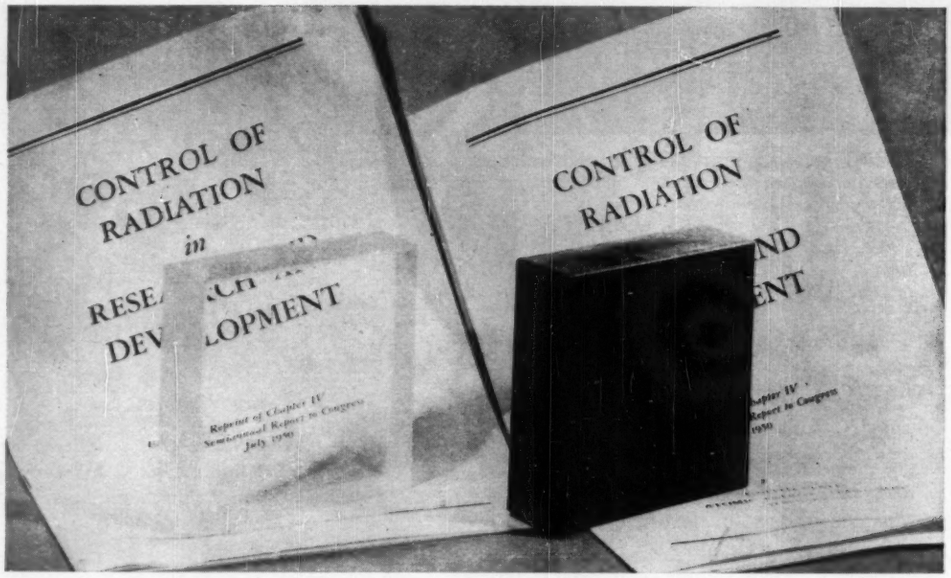
On the other hand, the Atomic Energy Commission hopes that studies of the problems created by sudden changes of temperature inside reactors will lead to a new understanding of the causes and cures of metal fatigue that may well "be applicable . . . to a variety of engineering structures subject to high-temperature service."

Another problem which reactor designers share with jet engine builders and electronics engineers is that of cost.

Because so many of the materials they use are new, expensive, and hard to work, this is already a major headache for nuclear engineers, as W. A. Loeb of Nuclear Development Associates points

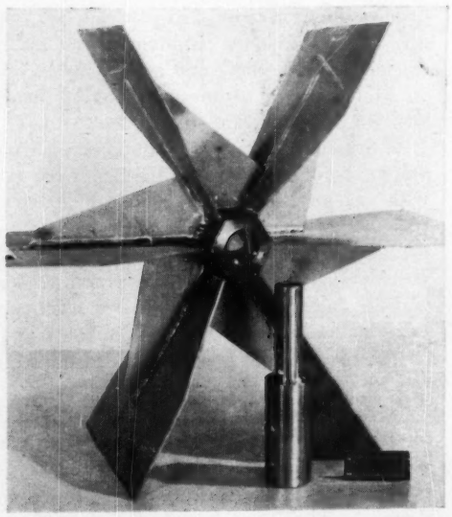
# *Atomic age*

Intense heat, high pressures, and the corrosive action of molten metals, water, and several kinds of atomic radiation—these are enough to try the soul of any engineer, and to faze the most durable of materials. Yet builders and operators of uranium refineries, nuclear reactors, and radiochemical processing units must face them—and conquer them—every day. As the photographs below prove, they've found several materials




**Radiation damage** creates problems in design of radiochemical equipment, reactor components. Neutrons and gamma rays darken ordinary glass, harden metals, embrittle plastics. But problems are being solved by new formulations like glass at left which, Argonne says, stands intense radiation.

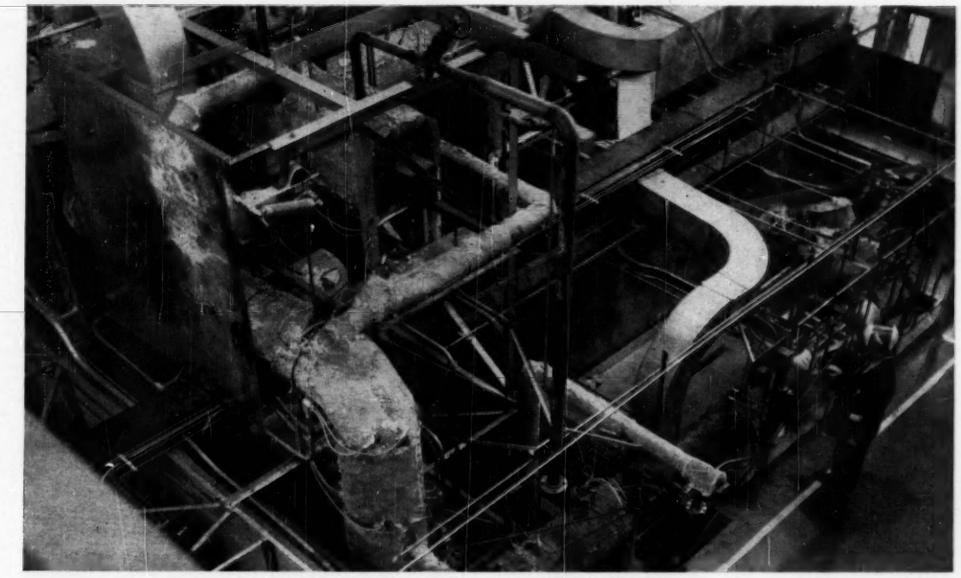
**New alloys** are borrowed from many fields to improve atomic products. *Elgiloy*, a strong, corrosion-resistant metal developed for watch springs is now used in radio chemical manipulators.



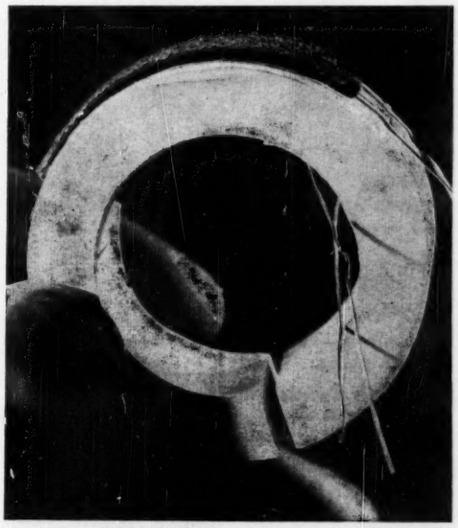
**New metals** are pressed into service to solve tough design problems. Zirconium fan wheel made by Bureau of Mines station at Albany, Ore., shows metal's weldability, corrosion resistance.

# *problems and solutions*

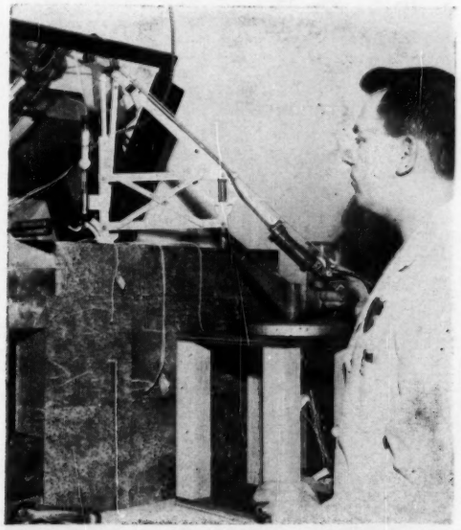
that can serve, and are testing a raft of new ones, among them a number of vacuum-melted alloys and a variety of ceramics and metal-ceramics. New types of coatings are also being studied—ceramics, enamels, and even gold plate—that may help such metals as stainless steel, molybdenum, vanadium, zirconium, and titanium (see page 43) meet these new and tough conditions. It's a wide open and potentially rewarding field.



**Corrosion,** by liquid metals as well as water, chemicals, radiation, is encountered in reactor design. G-E engineers at Knolls Atomic Power Laboratory use this set-up to test effects of molten sodium and sodium-potassium alloys on pipes and valves for atomic power plant heat exchange systems.



**Ceramics** attract new interest because of their resistance to heat and chemicals. Here, Battelle Memorial Institute uses electrical strain gage to measure stresses encountered in service.



**Marble** is one of several old materials that may find new jobs in the atomic age. Medical Division of Oak Ridge Institute of Nuclear Studies is testing it for use as radiation shield.

out. Not the least of the cost problems, Kaiser Engineers note, is finding out what some of the newer materials really do cost—and guessing what their prices will be in four or five years when plants now on the drawing boards are actually built. To-day's price quotations on such materials as ductile beryllium, hafnium, hafnium-free zirconium, and vanadium have all the validity of Kentucky colonelcies.

As this brief review indicates, product design for the atomic age is, first and foremost, a matter of materials. And, in selecting them, McLain emphasizes, it's necessary to consider not only cost, availability, physical and mechanical properties (including workability), and heat resistance; but also chemical properties, resistance to special types of corrosion and radiation damage, toxicity, neutron absorption, and build-up of reactivity under neutron exposure.

As Walter F. Friend of Ebasco Services remarks, "The problems of selection and adaptation of materials will tax the ingenuity of designers. We still lack even adequate screening and testing methods." But this, he points out, is a new frontier where skill and imagination, with a measure of luck, can achieve startling advances.

In many cases, atomic-age products must meet unique standards of leakproofness, durability, and ease of maintenance.

Leakproofness is vitally important. Even the tiniest pore must be sealed, lest it permit the escape of costly or radioactive materials.

The standards for durability and ease of maintenance are equally high.

As O. C. Schroeder, of General Electric's Reactor Section at Hanford, told a University of California conference on nuclear engineering, "Most of the equipment directly involved in the handling of irradiated process materials becomes contaminated to levels of radioactivity which may prohibit any possibility of manual or contact maintenance or repair."

It is not unusual for processing tanks to become so radioactive that personnel can not be permitted within 20 yards of them even when they're emptied—a situation which, as Schroeder wryly puts it, is "hardly conducive to the normal 'hand-wrench' type of maintenance." One can, of course, take the unit out of service and wait for the radioactivity to die down. But it's likely to be a long wait. (Cobalt, an alloying element in stainless steel, takes about five years to lose just half its radioactivity; and iron itself takes at least 47 days.)

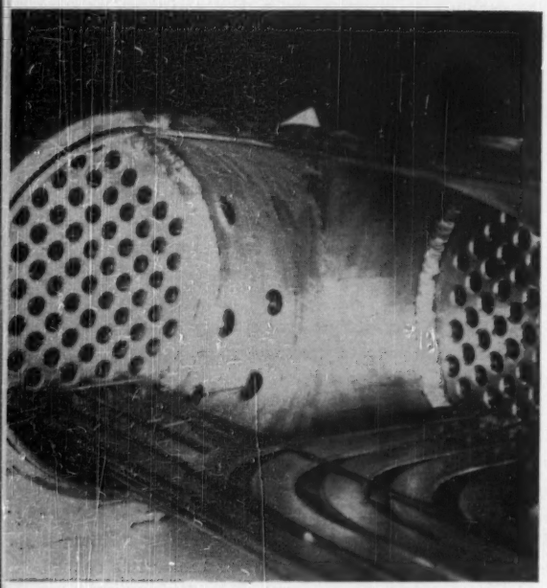
One answer is to design for maintenance-by-replacement, and this has been done. But, it is still better, Schroeder believes, to provide processing equipment which has an unusually long life expectancy; and, to strive throughout for the utmost in mechanical simplicity.

A tough assignment? Yes. But one well worth tackling—not only for potential profits but also for the fun of participating in the atomic age.

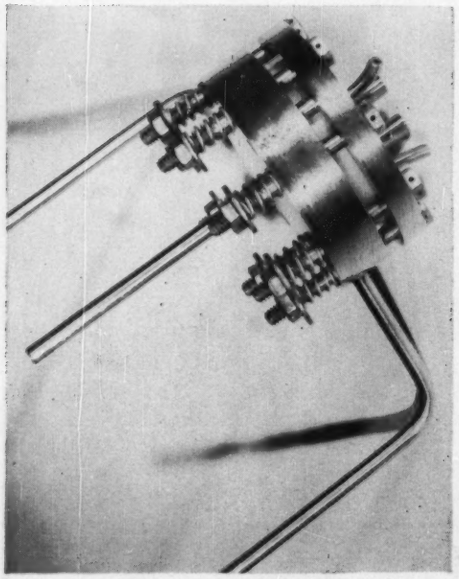
*Continued on page 42*

# *Stainless steel and glass serve many ways*

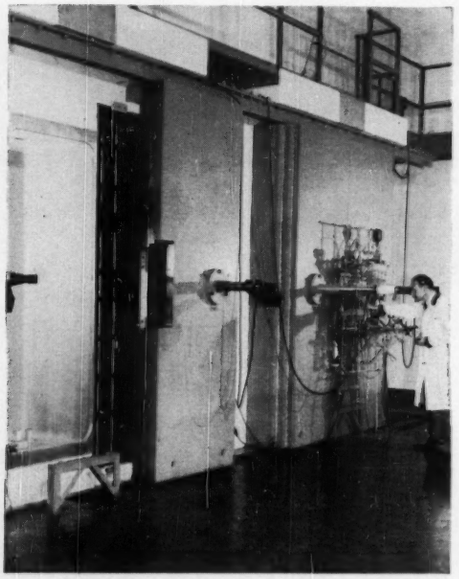
Two of the most useful materials of the atomic age were well established in the preatomic era; but much has been learned and many changes have been made to fit them for their new jobs. New forming and welding methods were needed for stainless steel, and several new radiation-resistant glass formulations had to be developed, including radiation-resistant and radiation-sensitive types. Similar research is achieving equally valuable results with many of the other materials described on the opposite page.



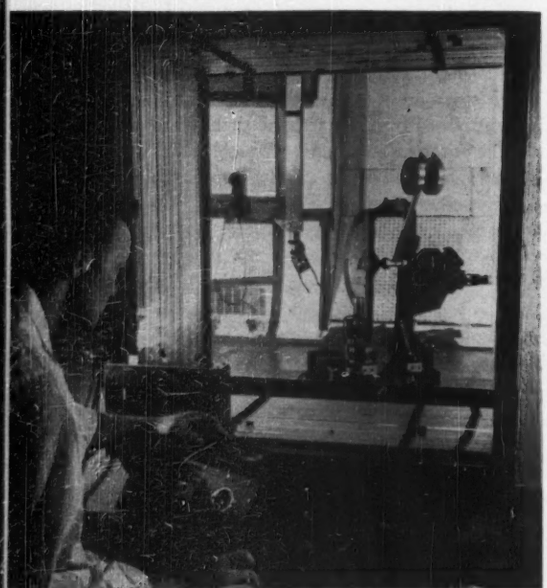
**Heat exchangers** for power reactors take advantage of stainless steel's corrosion resistance, often use nickel, too, as in this G-E model.



**Three-way valve** for new radioiodine generator at Brookhaven combines stainless steel and molded nylon for corrosion resistance and durability.



**Hot cells** at Brookhaven are lined with smooth-faced stainless steel for long life and ease of cleaning. Peelable plastic coating helps, too.



**Windows** for radiation test cells like this one at Westinghouse Atomic Power Division are multi-layered panels of special, non-browning glass.

**Dosimeter,** manufactured by Corning for military use, takes advantage of another special glass. This, a radiation-sensitive silver phosphate type.

**Cellular glass** insulates steel sphere that houses prototype reactor for one of the atomic submarines. This material is made by Pittsburgh Corning.

# *Structural materials of the atomic age*

Materials need strange talents to star in the atomic age. They're expected to be good actors under normal conditions, of course, and to stand heat, corrosion, radiation, and thermal shock. But, besides all this, they need special nuclear properties. Moderators must slow neutrons down without absorbing them; control materials must eat them up. Structural members must be almost transparent to neutrons; shielding materials, opaque. (Fuels, fuel carriers, coolants, and such shielding materials as concrete and marble, discussed on preceding pages, are not included here.)

### ALUMINUM

Because it does not gobble neutrons, can stand prolonged radiation, and does not itself have any long-lived radioisotopes, aluminum was one of the most important building blocks of the atomic age. It is still widely used for handling radioactive materials. But, as reactor temperatures go up, aluminum's value as a structural material and a protective cladding for fuel elements goes down. Don't write this metal off yet, though. New techniques like powder metallurgy and new alloys may bring it right back to the center of the stage.

### BERYLLIUM

Prima donna of the atomic age, beryllium is valuable because it is so nearly transparent to neutrons; but hard to handle because it is soft and very toxic. It is also—particularly in its most ductile form—extremely expensive. Nevertheless, it is used in reactors as a moderator, and in neutron-detecting instruments.

### BORON, CADMIUM, AND HAFNIUM

These are the neutron-gobblers, used as control materials because they take up neutrons so rapidly and in such large amounts. Hafnium is particularly interesting because of its relation to zirconium. The two occur together, and, until hafnium-free zirconium was obtained, the latter seemed useless for nuclear construction. Now, each is finding its proper place—one as a control material, and the other as a structural member and fuel cladding.

### CERAMICS

As operating temperatures go up—whether in jet engines or nuclear reactors—the hurry call goes out for ceramic-type materials that can take the heat. Oxides, borides, carbides, and nitrides of more than a dozen metals (including most of those described here) are now being tested for reactor use. In addition, much work is being done on ceramic coatings to protect such structural metals as molybdenum, titanium, and zirconium; and ceramic and enamel linings for processing equipment. As in other fields, though, broad application of ceramics as structural members awaits a solution to the twin problems of brittleness and lack of strength.

### GLASS

This basic material serves the atomic energy program in so many ways it's almost hard to count them. Several interesting applications are pictured and described on the opposite page. In addition, much glass equipment is used in radiochemical processing, and glass fibers are an essential ingredient of the filtration and dust-collection units used in many atomic plants.

### GRAPHITE

Without graphite, there would have been no atomic pile to pave the way for the atom bomb. Other types of reactors can be and are being built, but a graphite-uranium pile was the first; and graphite is still a key building block. It's a good moderator, relatively abundant, inexpensive, and easy to work. Its strength and corrosion resistance are satisfactory at moderate temperatures. Like other forms of carbon, however, graphite combines with oxygen rather readily at high temperatures.

### MAGNESIUM

Low neutron absorption, light weight, and good mechanical properties make this a tempting material for structural use. So far, though, its poor resistance to water corrosion has held it back. It is under consideration as a coolant and fuel carrier (along with sodium, potassium, bismuth, and other low-melting metals).

### MOLYBDENUM

High melting point, low neutron cross-section, and satisfactory workability recommend molybdenum for structural use—particularly in high-temperature reactors. Until or unless coatings are developed to protect it from oxidation, however, its use will be limited to those applications where the atmosphere can be controlled.

### PLASTICS

Inside nuclear reactors, few if any organic compounds can be used. All are seriously affected by radiation. In other phases of atomic energy production, however, plastics play a vital rôle. In addition to use as structural elements, plastic resins are used in formulation of the peelable paints that simplify decontamination. Plastic suits are used for protective clothing.

### STAINLESS STEEL

Not the best from a nuclear standpoint, nor the cheapest, easiest to fabricate, or most corrosion-resistant, stainless steel is still one of the indispensable materials of the atomic age because it represents one of the best available compromises. From ore-refining to treatment of atomic wastes, it has found 1,001 important jobs; and, as reactor and processing temperatures go up, it's likely to find more rather than less.

### TITANIUM, TANTALUM, AND TUNGSTEN

Until now, these metals have received relatively little attention. They have rather high thermal neutron capture rates and pose other problems as well. However, their good mechanical properties and corrosion resistance may well find them jobs in intermediate and fast reactors where neutron capture is not so serious a problem. Titanium and tantalum should also prove useful in radiochemical processing, as they already have in other chemical processing plants.

### VANADIUM

New to industry, this relatively rare metal is similar to titanium and zirconium in many ways. Like them, it becomes ductile only when highly purified. Then, it is quite soft and easy to form, though it must be protected from oxygen, nitrogen, and other gases during hot-working operations. High melting point (over 3,000° fahrenheit), and good physical and mechanical properties make it attractive for structural use, though its thermal neutron cross-section is not low.

### ZIRCONIUM

Outstanding corrosion resistance, low neutron absorption, strength, and workability make zirconium one of *the* metals of the atomic age. Its biggest problem, like that of molybdenum, titanium, and vanadium, is its affinity for embrittling gases at elevated temperatures. If means can be found to protect the metal from oxygen and nitrogen pick-up, its potential should be very great. For instance, it may be used as cladding for fuel elements in graphite-uranium reactors, where demand for increased efficiency is boosting operating temperatures above the point where aluminum can serve.

# SMALLER PLANTS SHARE THE HEALTH

*Broad in-plant medical programs that have cut costs, upped morale for big plants, now are becoming available to smaller units.*

ALFRED G. LARKE
*Employer Relations Editor*

IT IS often expensive to be poor. The poor man can't afford to pay the 50 per cent extra that would buy him a suit that would last twice as long. The little man pays retail prices for what the big man buys at wholesale because he uses more.

A similar situation has long existed in the field of industrial medicine. The big corporation, with thousands of employees, has been able to afford a thorough medical program that eliminates health hazards, forestalls accidents, gives better placement of personnel, cuts insurance costs, lowers workmen's compensation rates, improves employee health, and builds productivity by building morale.

The smaller company, not attaining the critical size to install such a program, has had to get along with piecemeal, second-best plans, or none at all. And, as a result, it has often incurred higher operating costs and lost out in the competition for the better workers.

Even a big company, if its employees are scattered in too many small operating units, has found the problem a tough one.

In a few places, co-operative industrial medical programs were tried out before World War II; the war saw an expansion of these efforts, and in the last five years the number and variety of ways in which the problem has been tackled have increased considerably.

In some instances, small plants have co-operated on their own or under the prodding of insurance companies and public health authorities to establish joint programs. In others, the doctors have initiated plans, joining together to offer a clinic service to such plants as desire it.

In the last year or two, this movement has taken on pace as companies and doctors have put their health facilities on wheels. The big clinic in the big truck-trailer is the symbol of small-unit industrial medicine in 1955.

Chain operators with a multitude of local establishments, like the oil companies, have put their company doctors on the road. In other cases (see next page), the doctors are taking to the highways on their own to bring the benefits of preventive and "constructive" medicine to whatever plants can make good use of them.

At least one insurance company, a Federal Security Agency study reports, grants premium rate discounts to employers with in-plant medical services: 5 per cent where preplacement examinations have been in use two years; 10 per cent where a dispensary is maintained, staffed by a physician or full-time graduate nurse; 5 per cent where a visiting nurse service provides treatment for non-occupational disability.

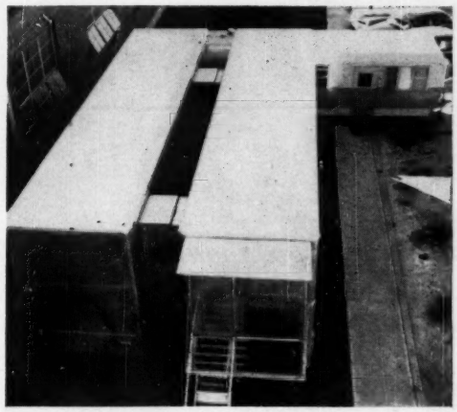
But the benefits go far beyond insurance savings, according to this study (Small Plant Health and Medical Programs, Public Health Service Publication No. 215). It cites a number of measures of value reported by the Allen Manufacturing Company, Hartford, Conn., during the first nine years of its participation in the Hartford Small Plant Group Medical Service, attributable in part or in whole to that program.

Allen Manufacturing's monthly turnover rate dropped from 5.5 per cent in 1943 to 1.9 in 1951. Lost time per 100 occupational absences went down from 4.2 to 0.0, and the accident severity rate from 0.455 to 0.032.

The monthly absentee rate, for all purposes including leaves of absence, dropped from 5.8 per cent to 2.7 per cent in the same period; grievances fell from 2.4 per 100 employees to none from 1944 to 1951. The percentage of long-service employees rose steadily, also, and dollar volume of sales per employee rose from 117 in 1943 to 266 in 1951, on a scale in which the 1940 rate equals 100.

Few companies appear to have attempted the detailed evaluation of medical programs that the Allen Manufacturing Company has. With only

*Continued on page 46*



Clinic on wheels: three OHS trailers on job.

Nurse from OHS takes worker's medical history.

Eyesight test is one among score of examinations.

Blood pressure—high, low, normal? Test tells.

## ROVING CLINIC ON WHEELS

***Anywhere on U. S. map, your plant is in this group's service area.***

Devoted men of medicine in the universities or the low-budgeted public health services, and loss-prevention departments of the more progressive insurance companies, provided the spur for most of the co-operative industrial health programs offered small and medium companies in the past.

To-day the idea has developed far enough that a new type of doctor is beginning to show on the scene—the man who not only sees this as a field in which he can do much good but also feels a flourishing practise may be built up in providing new and better industrial medicine.

Among the most enterprising is Dr. Logan T. Robertson, who, with his associates, has brought an organized medical program into more than 30 plants of 100 to 1,000 or 1,500 employees each in Asheville, N. C., and is now beginning to supply the same service to companies in Ohio, Texas, and Illinois—with facilities for many more localities.

A measure of his confidence in the readiness of industry to move from first-aid "medicine" to the more comprehensive and rewarding programs now available is his personal investment in an auxiliary organization, Occupational Health Services, Inc.

Dr. Robertson and his professional associates serve as medical directors of plants. Occupational Health Services may supply rolling clinic, technicians, nurses, laboratory services, health educational material to companies he serves—and to others, as well. But when OHS moves into a new town to conduct, for example, periodic examinations of all a plant's employees, it is the local doctors who do the professional manning of the smartly organized OHS equipment.

In Asheville, plants spend $5 to $15 an employee for preplacement examinations if that is the limit of the service they wish; or up to $30 per employee per year if they also have periodic examinations, nurse and doctor service for a certain number of hours per week, and a doctor's services in environmental control—of hazardous materials, equipment, practises.

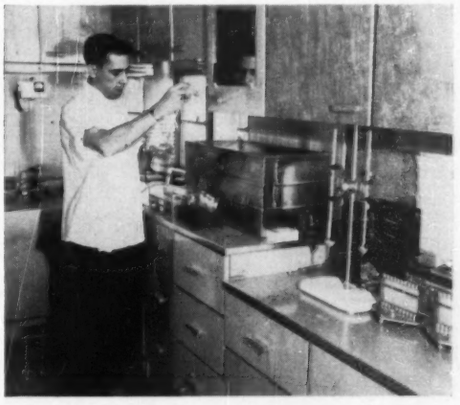
Preplacements are taken at a downtown clinic, periodics at the plant. Each plant has a dispensary costing $1,000 to $1,500 initially, in which a nurse and a doctor periodically render other services to employees.

On the road, among companies using the services to date, there has been a local medical director or a local clinic serving the plant for regular needs; OHS brings in its articulated, air-conditioned truck-trailer clinic (upper left) and rolling laboratory for periodic, plant-wide examinations.

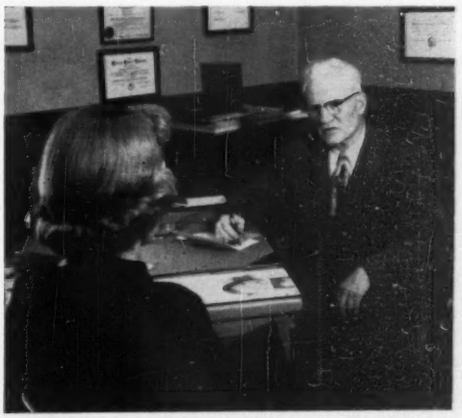
For details of this and widely different new plans, see text.

Chest X-ray is oldest of industrial examinations.

Audiometer test spots employee's hearing ability.



OHS technicians run all lab tests in trailers.



If care is needed, local doctor sees employee.

## *Want to investigate the possibilities for your plant?*
## *Here are sources of information on how to go about it.*

Some of the most detailed and authoritative information on medical programs for medium-size and small plants, including costs and possible savings, is contained in publications of the National Industrial Conference Board, 247 Park Avenue, New York 17, N. Y., available, however, only to members of NICB:

"Cooperative Medical Programs"—*A New Solution for Small Companies,* Studies in Personnel Policy, 1953.

"Company Medical and Health Programs," Studies in Personnel Policy, No. 96, 1948.

Other sources include:

*Small Plant Health and Medical Programs,* Klem and McKiever, Federal Security Agency, Public Health Service, Division of Occupational Health, May 1952. (Public Health Service Publication No. 215, Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C., 50 cents.)

*Health Maintenance for Greater Efficiency,* Metcalf, Small Business Administration. (Small Business Management Series No. 16, Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C., 25 cents.)

"Sharing the Community Job of Industrial Health," George A. Denison, M.D., *American Public Health Journal,* April 1944, Vol. 44, No. 4, 1790 Broadway, New York 19, N. Y. (Birmingham, Ala., plan.)

"Recent Experiments in Medical Service for Small Plants," Leonard Arling, M.D., *Occupational Medicine,* March 1947, Vol. 3, pp. 251–256. (Write Dr. Arling, 3101 University Avenue, Southeast, Minneapolis 14, Minn.)

"Health Maintenance in Small Plants," Dr. Lester M. Petrie, *Journal of the Southern Medical Association,* Vol. 44, No. 6, Birmingham, Ala.

*Continued from page 44*

minor exceptions, however, all who have once participated in such a program have valued it highly enough to keep it up. Only a small percentage have dropped out, although some cooperative programs have been abandoned because the participants became so sold on the benefits that they took on full-time medical directors and expanded their own plants' health activities.

Perhaps because the entire field is so new, the variety of ways in which smaller plants are tackling their industrial health problems is wide, even though the plans are not numerous.

Whatever the preference of the medical men and the managements involved, there should be one among the existing programs that will come close to fitting their needs and resources and to appealing to their philosophies. Some leading examples are described below.

The Hartford Small Plant Group Medical Service may be of prime interest to those looking for a guide, because it has been operating successfully for twelve years.

Eight Hartford companies ranging in number of employees from 200 to about 650 share the services of a single doctor in the Hartford plan. Each plant has a dispensary and at least one full-time nurse, and the doctor schedules his time to provide frequent, regular appearances at each dispensary. He is under contract to the companies, who share his monthly fee in proportion to his scheduled time in each plant.

The cost, according to Ellsworth S. Grant, vice-president of Allen Manufacturing Company and medical "contact man" for the group, runs from about $15 to $30 per employee per year, those who make most use of his services having a lower per-employee rate, it has been found.

The program provides preplacement, periodic and special-purpose physical examinations; treatment of injuries, maintenance of compensation-e records, industrial hygiene control, consultation and counselling with patients, medical education of employees, and treatment for minor non-occupational ailments, such as new dressings for injuries.

At least as comprehensive as the services of the Hartford group, but different in many major respects, is the program of Dr. Logan T. Robertson and his medical associates (see page 45), backed up by the physical facilities of Occupational Health Services, Inc.

In Asheville, where these doctors launched the project, some plants use their services only for preplacement physical examinations, sending prospective employees to a downtown clinic for a thorough check. Other plants engage Dr. Robertson as medical director and use the complete services.

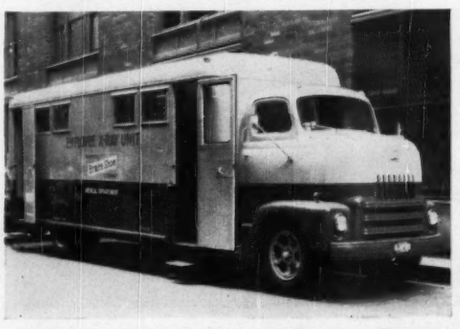
What's new about the Robertson plan, however, is the mobility given it by Occupational

*Continued on page 87*

### *Multiple-Unit Companies Put Doctors on Wheels*

Carter Oil Company and Phillips Petroleum Company (page 44), and American Brake Shoe Company and Humble Oil & Refining Company (to right), are leaders among companies that have found it necessary to put clinics on wheels to reach far-flung small units. The oil companies give general examinations, although not as complete as in the operations of OHS or the Northwest Clinic in Minnesota. Brake Shoe mobile unit gives chest X-rays; local doctors in plant dispensaries give other services. Humble Oil is taking four years to visit 9,275 employees in 300 field camps, and sales offices.

Humble Oil clinic examines 2,000 annually.



Brake Shoe log: 60,000 miles, 45,000 lung X-rays.

# *How much*
# SHOULD A PRESIDENT TELL?

***Is it enough to tell executives only what they need to perform their jobs or should a president disclose all—or nearly all?***

W. F. ROCKWELL, JR.
*President, Rockwell Manufacturing Co.*

DURING this decade it has become fashionable and profitable for top management to diversify its products, fill out its product line, and decentralize its plants. Mergers and rumors of mergers are constantly appearing in the business press. But while these shrewdly conceived attempts to capture a larger market segment or to achieve economies of scale are usually the result of a fantastic number of studies and hours of backstage planning, one key factor often eludes the planners. That factor is adequate communications.

Some communications are obviously planned, but actually they are nothing more than an appendage of the organization chart. It tells you in effect, with more or less elaboration, who shall report to whom. It is basically a scheme for intraplant communications. It is usually vertical and the dominant direction of information flow planned for is upward.

Clearly this type of communications planning doesn't solve these characteristic problems of diversification and decentralization:

First: How to select and transmit information that keeps top management informed *to and from* decentralized plants and, at the same time, encourages plant managers to make the right decisions under their own initiative.

Second: How to develop and maintain a staff of competent men to produce and sell a currently diversified product line and prepare these same men to step in and supervise, within a short time, the manufacture of any new product the parent company may acquire.

It seems to a great many practical theorists in management that these problems cannot be solved by narrowly channelling the flow of information; in which case an executive gives and gets only that portion of company data that is pertinent to his immediate job. Though it may seem paradoxical, a management man needs to know more than he needs to know to perform his current duties satisfactorily.

The policy we are evolving is one of near-total disclosure of operating information to an extensive group of management, production, and sales personnel. The range of subjects is extremely broad and the analysis is thorough and deep.

### Dangers in Telling Too Much

Conceivably, total disclosure or an approach to it could create problems. We have been asked whether there are not inherent dangers in telling too much. We know there is a chance that some executives may worry about situations over which they have no control or actual responsibility, and also there is the possibility that executives who themselves have not lived intimately with a problem may not see it in its real perspective and some distortion of the true picture could result. These dangers are potential, of course, but this is not the best of all possible worlds and, in the long run, it seems to us that there is less likelihood of distortion or misunderstanding when an executive is told everything than when he is told a little. This would be true, we think, even in the small company. But when the parent firm has plants in sixteen different communities and sells to fifteen different major markets, the opportunities for misunderstanding and the need for near-total disclosure are both multiplied enormously. Our solution gives executives down to the supervisory level the type of data which, in most companies, would be restricted to the board of directors.

Obviously it is not possible for a president to bare his corporate soul completely or indiscriminately. We do not, for example, release information on contemplated acquisitions of companies. That information is considered highly confidential, and normally is restricted to a very small group of top-management people. This is an extremely sensitive area and disclosure to a large group could have an effect on negotiations and might encourage other companies to approach the "prospect" or might even cause the prospect himself to shy away from negotiations if news of a potential acquisition became widespread.

Nor do we present individual product profit-and-loss statements at annual management meetings. These are operating statements and are considered the business of top management and the individual product managers involved, rather than general corporate information. The profitability of individual items is a matter for our Products Committee to consider.

Finally, we do not release detailed budget figures on each division at the Annual Management Meeting. Actually, this is a matter of degree for Rockwell does show comprehensive sales forecasts, but not down to fine details on such elements as administrative expenses, for example. This information is provided throughout the year to the individuals directly concerned and is a matter for top divisional management.

Those are the only significant exceptions to our policy of near-total disclosure. The system we use to disseminate information is simple. Subject classifications are broken down into three categories—general, sales, and plant. Though this might appear to be compartmentalization, it is far from it in practise. Our sole reason for these breakdowns is to get to the various management groups the data they need and can use, with a minimum of wasted reading time.

### The President's Letter

Most of the devices we use to distribute information are shown graphically on the following pages. Some of them might be worth looking into in greater detail. The purpose of the President's Letter is to keep management personnel informed of the company's current operating status, the outlook for operations on a short- and long-range basis, and to provide a means

**HOW MUCH**

**SHOULD A PRESIDENT TELL?**

# *Custom Tailored* COMMUNICATIONS . . .

**GENERAL**

- The President's Letter
- "Hour of Enlightenment" — management meeting.
- Management Meeting—once a year.
- President's weekly staff meetings.
- Research/development newsletter—quarterly.
- Encouragement of supervisors to call individual meetings with departmental members to discuss subjects under consideration at supervisory conferences.
- Employee meetings every three months. The president discusses such diversified subjects as vacation policy or general business conditions.

**PLANT**

- *Rockwell News* (house organ).
- Internal publicity releases.
- Bulletin boards.
- Letters from president direct to employees' homes.
- Supervisory conferences.
- Letters to supervisors.

**SALES**

- Regional managers' meetings held once a month.
- District managers' meetings once a year to discuss present and future sales potential.
- Regional meetings once a year so each regional manager can discuss sales potentials in certain areas.
- District meetings once a year at which time the district manager develops new sales potentials in his area with advice from sales force.
- District managers' bulletins sent out regularly to regional and district managers to cover operating data.
- Sales engineers' circular letters mailed frequently to the entire sales force.
- A monthly publication called the *Direct Line* sent by each product division to salesmen handling its products, covering pertinent data and delivery information.
- "News Flash" bulletins containing short memos sent to the entire sales force. They show current personnel changes in the sales organization and other material of immediate interest.

---

whereby the president can pass along his views on a confidential basis without writing individual letters.

The letter is mailed once a month as soon as current operating statements are available, and it goes out to all plant managers and staff personnel. Each vice-president in charge of a division sends out a letter of his own, similar to the President's Letter. The contents of this letter are pertinent to the sales and operating portion of the President's Letter.

The first few paragraphs of the letter are devoted to an analysis of the previous month's operations, including sales, cost of sales, profits earned before taxes, and earnings per share. The figures are always compared with the previous month and the same month the prior year. Operating figures are broken down for each plant and each major product line.

The next major item deals with inventories. We show a complete analysis: historical comparisons; plant and warehouse figures on an increase/decrease basis; breakdowns of raw materials, goods in process, and finished inventory. Also explored is the outlook for decreasing, increasing, or maintaining current levels.

To gather additional information for this letter, each member of my staff is asked to contribute any material he considers pertinent. These contributions make up another portion of the letter and cover such items as industrial relations, purchasing, public relations, engineering, research, and so on. For example, the industrial relations manager may report the signing of a labor contract at one of the plants. He will detail the basic terms of the agreement. The purchasing department may include comments relating to current price movement, with recommendations for appropriate action.

The final subject of the President's Letter includes all major personnel changes that have taken place during the month.

### Why a Management Newsletter?

This device allows me to discuss current and anticipated operations with a wider group of people throughout the company. This newsletter is published quarterly and sent from my office to about 450 personnel ranging from the chairman of the board to plant foremen. All are considered management personnel.

The pattern and contents of the Management Newsletter are roughly similar to the President's Letter, and the first seven or eight paragraphs are devoted to an analysis of operations during the quarter just completed. Usually, anticipated business and need for certain action in the various operations are discussed.

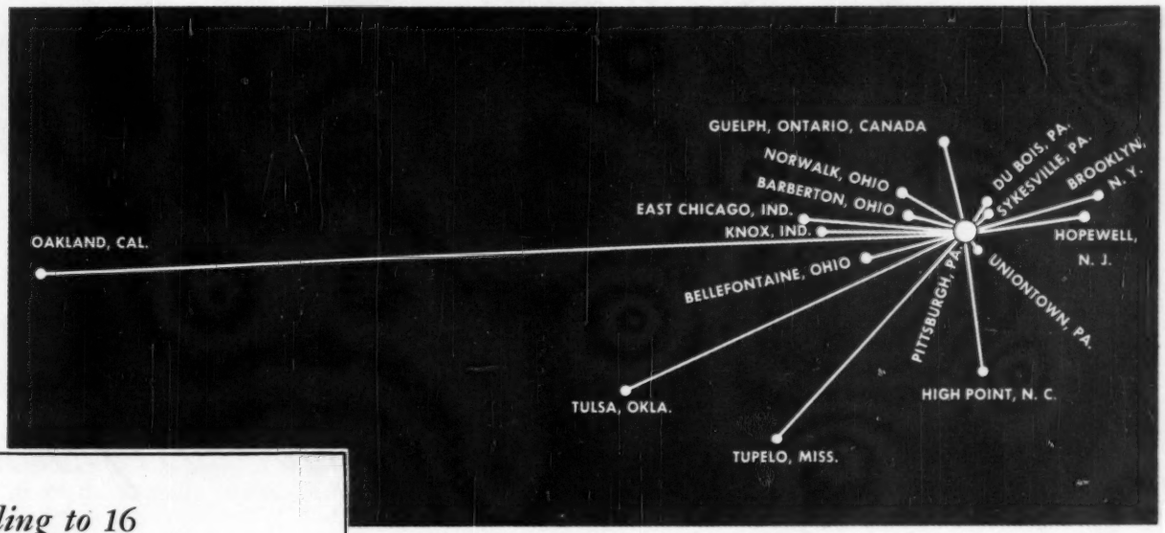
We shift next into budget data. Here, a complete analysis of plant budgets is made, showing ratio of actual costs to budget on such factors as shipments, cost of sales, general and administrative expenses, and plant operating profit. We comment here also on budget performance of various plants and sales operations.

Another, somewhat unusual, section is called "Management Tips." It is actually a management suggestion system. Each recipient is requested to send in items which may be of use in other plants or sales departments. This type of cross-fertilization is extremely helpful. For example, the general manager at our Norwalk plant reported an item on a pattern change that was adopted by other plant managers. Many of our regional sales managers are now using a routing system developed by one sales manager and reported in this part of the newsletter.

In late February or early March, we hold our annual Management Meeting. The actual timing is dependent upon the availability of year-end summary data from the accounting department. The main meeting starts on Monday and continues through Wednesday. On Thursday our two main divisions, Meter and Valve, and Power Tools, branch off into special meetings that last through Saturday. In these latter meetings, regional sales heads and plant managers discuss current operating problems of their particular division. All staff members of the home office participate on an informal basis in discussions.

A typical agenda starts off with an opening review by the president of past and future opera-

# . . . they weld together widely separated plants




### *Selling to 16 Diversified Markets*

Petroleum Industry
Chemical Processing Industry
Gas Industry
Construction Industry
Lumber Industry
General Manufacturing Industry
Transit Systems, Toll Roads
Water Works (Public Utilities)
Municipalities (Parking Authorities)
Schools and Institutions
Hardware and Mill Supply Firms
Electrical Industry
Taxicab Operators
Hobbyists
Marine Industry
Gas Utilities

tions. During this analysis general managers may interrupt me at any time for further elaboration or clarification. After this comprehensive summary, we discuss the business outlook for our divisions and their markets. We then swing into industrial engineering; industrial relations; research; cost reduction; insurance and credit—concentrating on programs for the year. We finish up with a summary, a quiz and review.

The last subject, quiz and review, is an excellent employee relations tactic that has built up friendly rivalry within the company. It also keeps the executives on their toes. The quiz is made up by each speaker during the meeting who then submits two or three questions and answers to a committee. Notes taken during the meeting are permitted as aids and everyone participates, including me.

Another method for disseminating information across divisional and product lines is a medium we call the "Hour of Enlightenment." Programs are assigned to various members of the organization from three to six months in advance. These members are charged with putting on a program that runs an hour at the end of a working day. The purpose is to "enlighten" from 75 to 100 management and department heads.

One successful "Hour" was conducted by Delta Power Tool's "Homecraft" product manager, who gave actual demonstrations on the use of each tool in the home workshop line. Another was conducted by our controller, who explained in considerable detail how to read a balance sheet and profit-and-loss statement, and, particularly, how to read ours.

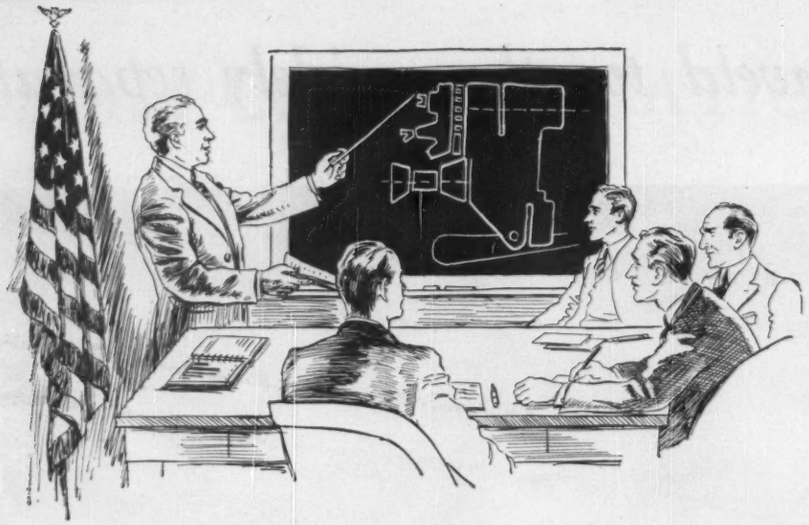
In the treatment of subjects—both general management subjects as well as specific products or divisions—emphasis is placed on capturing and holding the interest of the listener. We learn a lot from the "Hour," but it is entertaining too, and that accounts for its success.

Still another device we use to keep management and company employees informed in plants located in sixteen different sections of the country is a plant newsletter. This newsletter contains operating information about each plant's performance and anticipated performance. Individual plant personnel write and edit the letters, which carry titles showing their location and product category.

In addition to the devices listed on the opposite page, each plant initiates its own communications program. Our Edward Valves, Inc. subsidiary, for example, regularly issues three different bulletins directed to employees and stressing the needs and techniques of cost reduction. A single-page memorandum is issued monthly to acquaint all employees with economic problems of their markets. Another multipage bulletin, directed to supervisory and key personnel, is issued monthly. It describes in detail operating problems requiring attention. A weekly bulletin is distributed to the sales force, concentrating on competitive market developments. All manufacturing supervisory employees attend a supervisory training program which emphasizes the need for a vital communications program.

### "Merchandising Communications"

Most of the devices described here are, in one form or another, in common usage by a large number of companies. In fact, few companies of any size fail to have their plant newspapers, bulletin boards, and meetings at all levels. We probably use more media and devices than most and we like to think that we do an unusual job of merchandising our communications. The consumer—in this case the outlying plant manager who must at one and the same time be taught self-reliance and company-wide co-operation—is psychologically more accessible if our communications to him come in an attractive package. In other words, a purely quantitative evaluation of any communications program is not enough. We use every method in the book to dramatize and clarify our communications. Very simply, we believe in merchandising a message. It's not enough to send a memo, even to one of your own executives. You have to sell it to him.



# Management's Role in Defense

MELVIN ANSHEN

*Professor of Industrial Administration*
*Carnegie Institute of Technology*

***DESPITE** any changes in world tension, the United States must always be prepared for emergencies. Top management is a vital cog in the defense machine, but the future problems will not be the same as yesterday's. The author discusses the nature of tomorrow's problems and methods that can be used to meet them.*

A BACKWARD glance at World War II experience will provide a useful base from which to forecast and appraise the management problems of the next potential emergency. The following factors were of outstanding importance. First, there was an extended arming period, and for a long preliminary phase this nation was not at war. Later, after Pearl Harbor, our allies held the fighting lines while we organized production facilities; enlisted, trained, and equipped our military forces; and, in the management area, invented and experimented with techniques for directing mobilization and stabilization. Peak munitions production was not attained until late 1943. The principal reason for the delayed build-up was in the management sphere: creating, testing, and applying administrative machinery for mobilizing production. A contributing factor was the time required to untangle the administrative mistakes of the earlier period.

The second dominant condition in the World War II experience was the imposition of defense and war production on a slack economy. We had unused and available reserves of production facilities, materials, and manpower. The presence of these reserves cushioned the transition from peace to a war economy.

The final condition was the insulation of the domestic economy from direct attack. Production, transportation, and communications facilities were not subjected to bomb damage. Public morale was never eroded by mass devastation, fear, or panic. No resources had to be diverted from munitions and related production to reconstruction and rehabilitation assignments.

These three conditions profoundly influenced (1) the kind of management organization that was created to deal with mobilization and stabilization problems, (2) the character of the administrative machinery that was developed, and (3) the ultimate success of the over-all economic performance.

The Korean emergency, principally because of the limited size of the military requirements, did not present management problems significantly different from those met in the period 1941–1945.

If we consider the potentialities of the new weapons developed in the past few years and the kind of military strategy they suggest, the following assumptions seem reasonable:

1. Our participation in a full-scale war is likely to begin with a surprise air attack on the continental United States.

2. Heavy and unpredictable damage will be inflicted on production resources, transportation facilities, and communications networks.

3. The mobilization administration organization, however well planned prior to the attack, will be disrupted.

4. The general strategic defense plan, as developed prior to the emergency, may have to be modified as a result of the attack, at least in its timing. With even greater confidence it can be predicted that the tactics by which the plan is accomplished, in the industrial back-up sector, will have to be improvised in ways that will depart significantly from preattack projections.

5. The disruption of communications networks and the resulting interference with the

inflow of information on bomb damage and the backflow of instructions on reconstruction, production, and the use of labor and materials, will seriously hamper the ability of mobilization administrators.

6. The country is likely to be swept by a wave of unreasoning panic that can be controlled only by vigorous, rational action that will command wide support.

In these circumstances, the management organization and the administrative machinery that ultimately proved effective in dealing with mobilization and stabilization problems in World War II are hardly likely to be useful. If civilian management planning substantially reflects the distillation of wisdom drawn from careful study of our last war experience, it is likely to be guilty of the same backward-looking orientation that is supposed to be the cardinal sin of the allegedly "unimaginative" military mind.

Among the new management problems suggested by a preliminary consideration of the assumptions noted above, the following can be labelled as highly probable:

1. Administrative control of industrial mobilization must be established promptly, almost instantaneously.

2. Ways must be found to decentralize mobilization decision-making, in contrast to the centralized decision-making of the earlier war experiences.

3. In areas suffering extreme bomb damage, rationing of consumer goods must be introduced immediately, the range of products rationed will be much broader than in World War II, and the working of the system will have to be much more nearly automatic.

4. The vertically interlocked industrial structure of World War II must be given much greater flexibility. Manufacturers working on military orders must be free to shift suppliers rapidly, to replace bombed-out with functioning producers, and to change their production schedules.

5. An economy suffering massive bomb damage will require strict public management of the use of many resources that went virtually uncontrolled in World War II.

6. Policy will have to be formulated and strictly administered along lines where we have literally no past experience, namely in directing the use of resources as between rehabilitation and reconstruction, on the one side, and new production, to assure survival and victory, on the other.

7. Manpower may be the critical resource from the outset of the emergency.

There is little or no background in our previous war experience for dealing with these problems. New management techniques will be required.

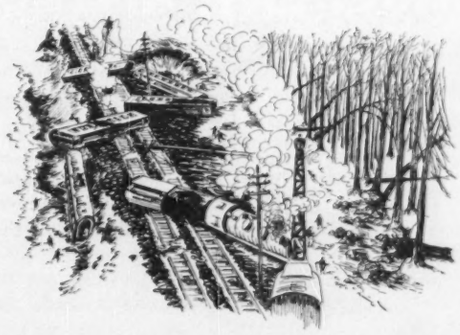
Responsibility for making plans to administer the next war emergency is now centralized in the Office of Defense Mobilization, in the Executive Office of the President. The Director of ODM is a member of the National Security Council. He reports to the President and deals directly with the Secretary of Defense and the Chairman of the Joint Chiefs of Staff, on the military side, and with the Secretaries of Commerce, Interior, Treasury, and many other heads of federal agencies responsible for segments of the administrative task, on the civilian side.

Under the general direction of Mr. Arthur Flemming, ODM Director, this staff agency has undertaken a number of activities designed to fulfil its responsibility in specific terms. Important preparatory work has been completed or is in process in three particularly critical areas:

1. Organizing over-all, time-phased projections of full mobilization requirements for facilities, materials, manpower, and other production resources; comparable projections of available supplies of these critical resources; and resulting projections of feasible military programs and a balanced military, industrial, and civilian effort.

2. Preparing prototype organization structures for the administrative agencies that will be created in the event of full-scale war.

3. Preparing specific procedures for mobilizing industrial resources, stabilizing the economy,



and translating policy decisions into action programs in the event of an emergency.

Although the existing small ODM staff, and its assisting agencies elsewhere in the federal structure, are sensitive to many of the new problems that are likely to be encountered in a war emergency, the only management area where important concrete progress has been made up to this time in planning for a future that does not resemble the past is in the development of machinery for controlling industrial production.

The basic production control mechanism of World War II and the Korean invasion, the Controlled Materials Plan, has been recognized as a management tool that is outmoded, unnecessarily cumbersome, dangerously hard to install, and operationally rigid. It has been replaced by a more flexible technique that can be placed in operation without the long delay that is an inevitable accompaniment of CMP. The Defense Materials System represents a significant forward step in strengthening the nation's ability to defend itself.

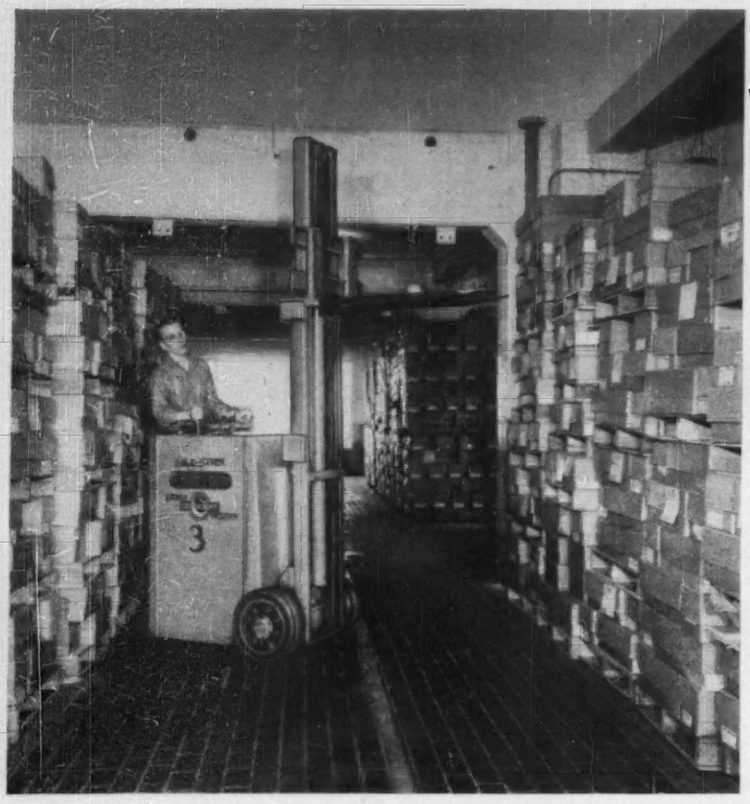
The balance of ODM's preparatory work now in process is, of course, essential. There must be plans for organization and for operating procedures, held in readiness for an attack-emergency. Even if extensive bomb damage and broken transportation and communications nets make it impossible to put such plans into effect as they are now blueprinted, the plans will be of some value as important immediate guides when the blow falls.

But an essential accompaniment to even the most elaborate preattack planning of mobilization procedures must be the existence of a reserve corps of men who can be called to action as civilian administrators. These men must be familiar with the kinds of problems likely to be encountered in such an emergency, experienced in dealing with these problems, and instructed in emergency assignments.

Only in this way can we be confident that a competent management team will be in existence after the surprise attack. And only in this way can effective preparation be made in advance of the attack to deal with the new problems created by new weapons and new military strategy.

To attain the goal of training management teams for the post-attack emergency, we face a problem similar to that faced by the military services in training officers in peacetime for the tasks, responsibilities, and decision-making they must assume in war. One of the most useful devices developed by the military for this training job is the "war game." Officers are thrown into situations that are likely to arise in war. They direct the maneuvers of troops. They make decisions based on available, often incomplete, information. They acquire skill, flexibility, and experience in emergency management of military problems. War games are no substitute for battlefield experience, but they offer a peacetime approximation.

We face a comparable problem in the area of industrial mobilization and stabilization. We cannot prepare for the next war by developing programs, organizations, and procedures based on past experience alone. In the event of a surprise attack on the United States, we will need advance designation of men in industry, government, and the universities (1) who know their emergency assignments, know where to go,



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and know what to do when they get there; and (2) who have previously been exposed to some of the problems of decision-making in a post-attack period.

The requirement, it should be observed, divides into two related parts of equally critical importance. The first is the advance recruitment and training of a reserve corps of administrators drawn from business, Government, and the universities. These men should hold specific emergency assignments and should be prepared to step into these assignments when called (with obvious allowance for those whose other commitments make this impossible in an emergency).

### Learn By Doing

The second requirement is the invention of a peacetime device for reproducing at least some of the mobilization and stabilization problems that are likely to arise in the event of attack on this country. This device will test the validity and practicality of current emergency plans and procedures. The bridge between the two parts is the need for training emergency management teams by confronting them with the kinds of problems likely to arise in the post-attack period, and calling on them to take management actions, to make decisions, and to use the pre-attack plans and procedures. In this way, the usefulness of pre-attack plans and procedures will be demonstrated, or their inadequacies identified, and the way pointed toward better plans and procedures.

The device of the war game developed by the military may be a useful way to accomplish both the training of men and the concurrent testing of plans and procedures. Certainly the idea looks promising enough on first examination to deserve more detailed study and experimentation.

The proposal to create an Executive Reserve of personnel available for management positions in government during a period of emergency has already been the subject of exploratory study. The need is clear beyond dispute. In every preceding war emergency of this generation, the mobilization and stabilization agencies have had to engage in haphazard recruitment of staff on a "crash" basis.

Inevitably, such recruitment has


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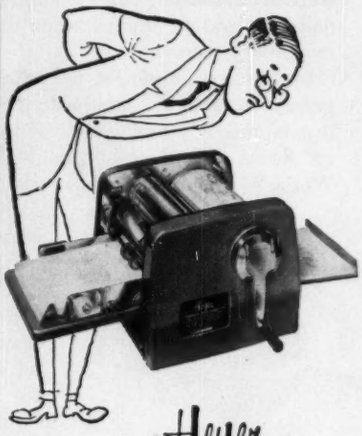

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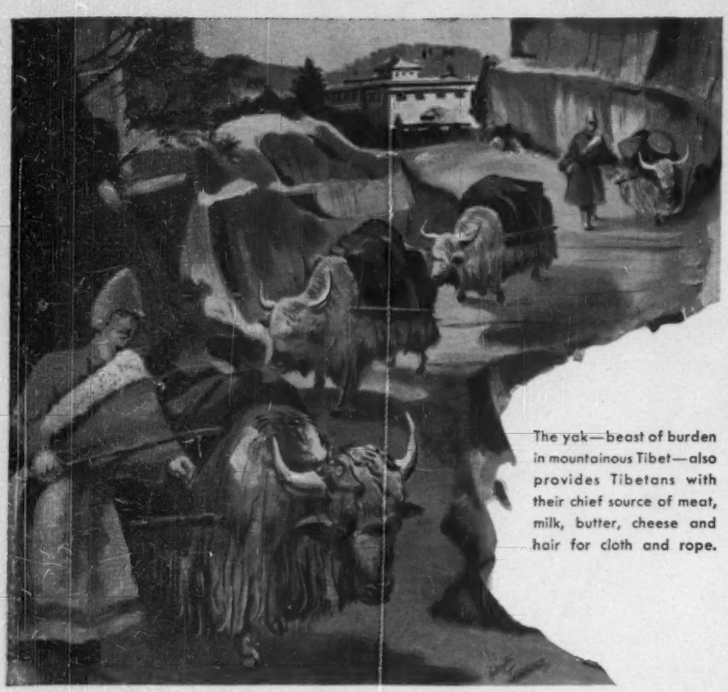

The yak—beast of burden in mountainous Tibet—also provides Tibetans with their chief source of meat, milk, butter, cheese and hair for cloth and rope.

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been carried on largely through the channels of personal acquaintance. In too many cases, companies have responded to calls for help by recommending men because they were available at the time, rather than because of their special competence. The nation's emergency security requirements are too important to be served in this way.

### Get the Best

Our appraisal of future needs must, however, go beyond this particular criticism of the past. The problems of managing individual companies in a war economy—including the vast complex of problems associated with living under Government rules and regulations—are too difficult and too closely related to securing maximum production for survival and victory to sanction placing the overriding responsibilities of government administration of the post-attack economy in the hands of men chosen by such a haphazard selection process.

Creating and manning the management reserve is a first step. To make this action really valuable, the men chosen to serve in the reserve must thereafter be given some exposure to the kinds of problems they will face if enemy attack makes it necessary to call the reserve into active service. Much more is involved than a periodic briefing in the government's emergency plans and procedures. This is the essential foundation. But if the assumptions on post-attack conditions outlined earlier in this article are at all realistic, the critical element in the training of emergency management personnel is their exposure to unforeseen conditions and their accumulation of experience in adapting pre-attack plans and procedures to post-attack conditions.

Experience in dealing with issues of the following kind is required. Given various magnitudes and distributions of bomb damage in this country, to what extent and how should planned full-mobilization military production and procurement be modified and assigned? Consistent with this determination, to what extent and how should pre-attack plans for the assignment of resources for the maintenance of the civilian economy be adjusted? How adequate are pre-attack plans


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and procedures for feeding information on damage to a central administrative headquarters? Is the information provided useful?

Should procedures be established for uniform reporting of bomb damage, and, if so, in what terms?

### More Questions

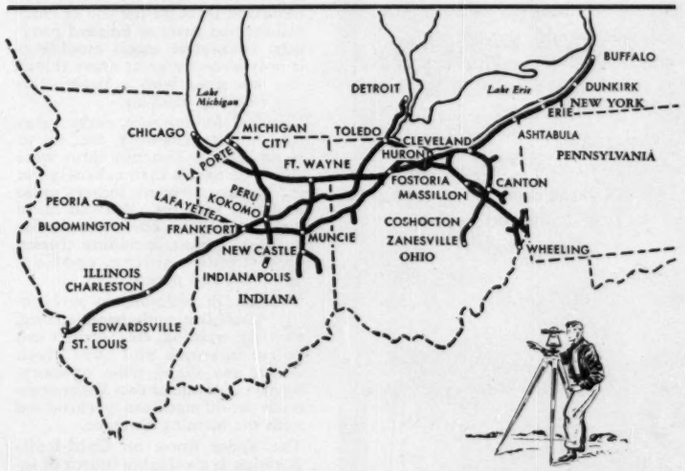
What kinds of decisions will be called for in assigning the use of resources as between reconstruction and rehabilitation, on one side, and new production, on the other? Can responsibility for making such decisions be decentralized? If it is decentralized, how can it be controlled? What kind of decentralized organization should be established? What advance provision can be made for staffing and training?

Are currently planned control procedures correct in using the allocation of selected critical materials (steel, copper, aluminum, and so forth) as the principal machinery for controlling production and construction?

Given the anticipated post-attack conditions, will the allocation of labor be essential, too? If so, how can this be accomplished? What about the allocation of auxiliary resources: transportation, power, communications?

Even this brief listing of issues suggests that they are not likely to be resolved in the vacuum of theoretical discussion. Tentative answers can be worked out only by trial-and-error methods. And the same exploratory procedure is the only way to provide experience for answers can be worked out only by trial-and-error methods. And the same exploratory procedure is the only way to provide experience for the men who will be called upon to deal with these problems in the event of atomic attack.

Hard experience has made it clear to the military that the commanders of the next war cannot be trained for their great responsibilities by reading treatises on strategy and tactics and preparing and reviewing paper plans. With this as essential background, they are exposed to emergency decision-making in commanding troops, ships, and planes under mock-war conditions. Commanders are trained in this way, and paper strategy and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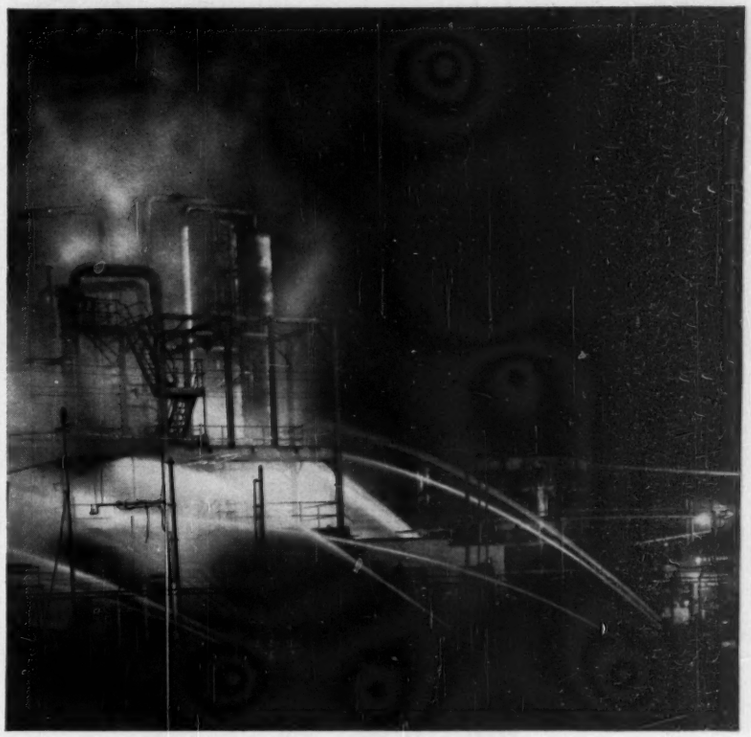

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tactics are tested in practical application.

The same device can be used in the same way to train civilian managers of mobilization and stabilization for their emergency assignments, and concurrently to test paper plans and procedures in practical application. They will learn best by practise—and that may be the only worthwhile way. This is essentially the case for setting up a series of civilian war games under the direction of the Office of Defense Mobilization, and with the co-operation of other military and civilian agencies (notably the Civil Defense Administration) and of industry.

### Basic Ideas

The major elements in a civilian war game of the kind projected here would include:

1. Assembly of a selected management team drawn from the personnel of the mobilization reserve corps in industry, government, and the universities, with the bulk of the membership coming from industry. The physical site of the exercise might be one of the emergency locations selected by ODM as an administration center in the event of bombing of Washington. Five days would appear to be a reasonable allocation for the conduct of an initial war game exercise.

2. Assignment of the management team to serve, for the duration of the war game exercise, as the top staff of an identified emergency agency in the immediate post-attack period. One early exercise might focus on the problems of the

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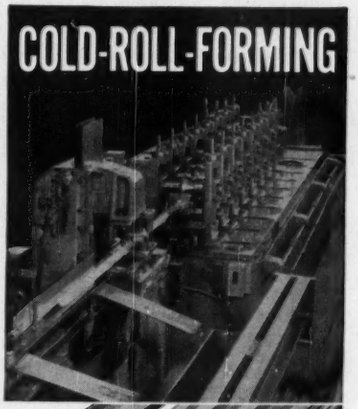

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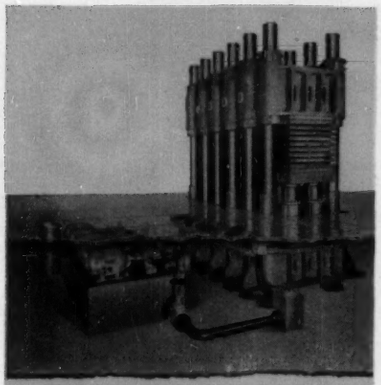

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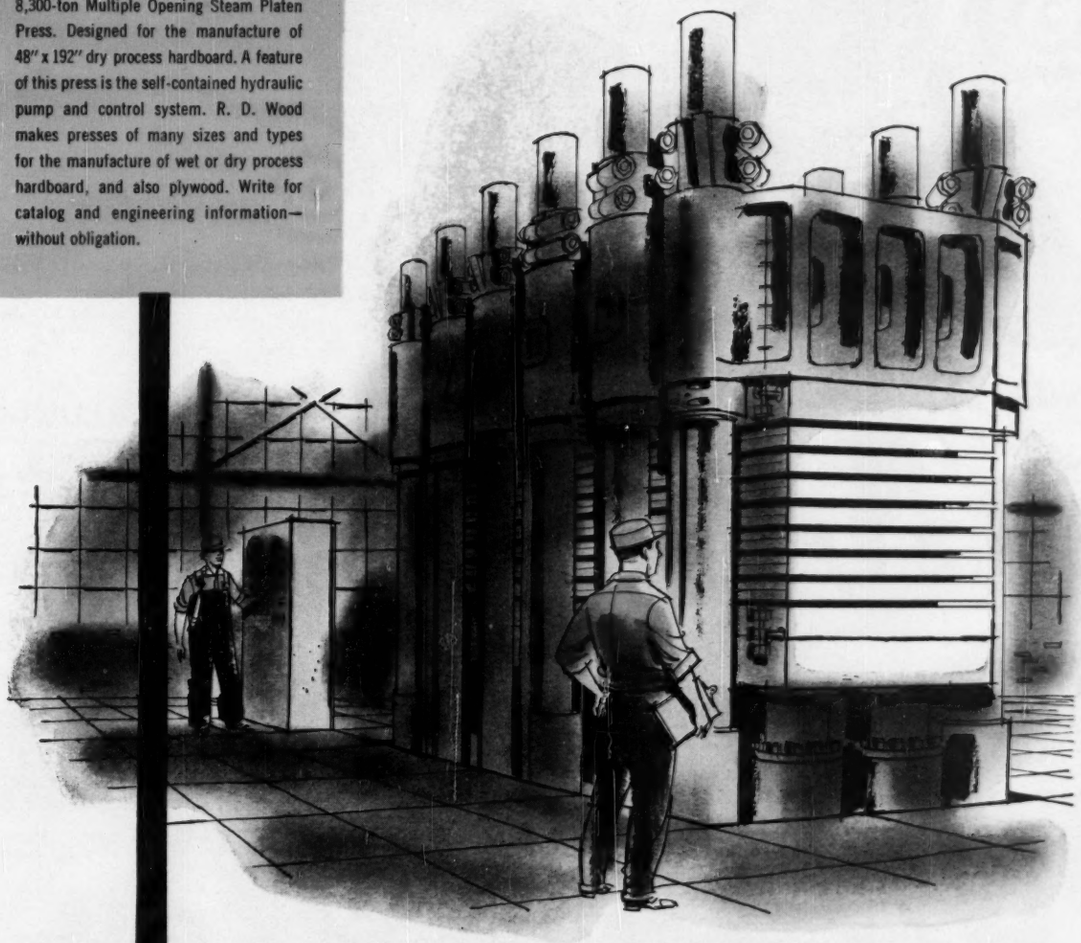

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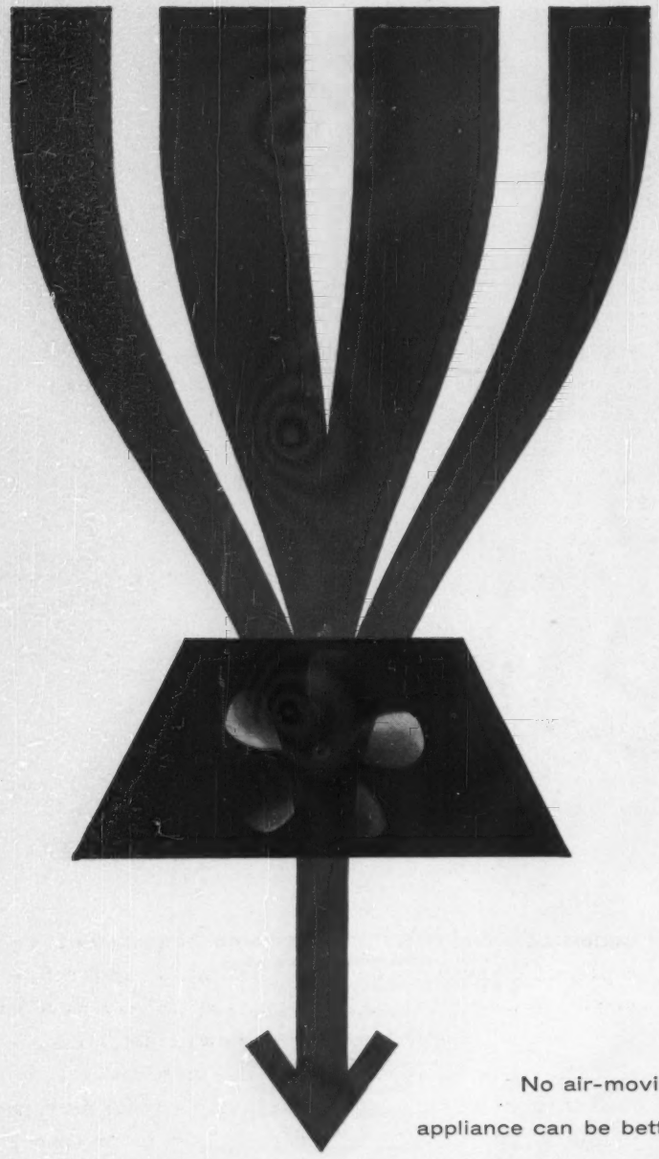

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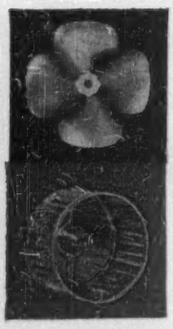

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agency concerned with production and construction. Another exercise might focus on price and rationing problems. Additional exercises could explore problems in the manpower area, in transportation, power, communications, and so forth.

3. Briefing of the management team on the full range of pre-attack plans and procedures. The briefing would include full information on pre-attack plans for dealing with a post-attack emergency, following an air strike resulting in substantial damage to resources. The briefing period might occupy the first day of the exercise.

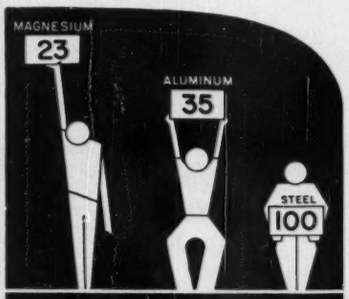
### Action Starts

4. Initiation of the active phase of the exercise. The first working assumption would be that an air strike on this country has occurred, resulting in serious damage, including destruction and casualties in Washington. The assembled group is responsible for managing its assigned economic function.

5. Operation of the exercise by means of feeding into the management team a flow of prearranged damage reports, thereby creating simulated emergency conditions in which specific administrative decisions are required. The role of the management team would be to make the decisions and take the actions appropriate, in their judgment, to the circumstances in which they find themselves. In preparing bomb damage and related information fed in as factual raw material for the exercise, a principal objective would be to pose a series of problems designed to test the adequacy of information flow, planned control procedures, and planned organizational structure as a basis for making and executing decisions.

HOWE PHOTOGRAPH

6. Conclusion of the exercise (the final half-day, or full day) with a round-table critique session. At this time the adequacy of pre-attack plans, procedures, and organization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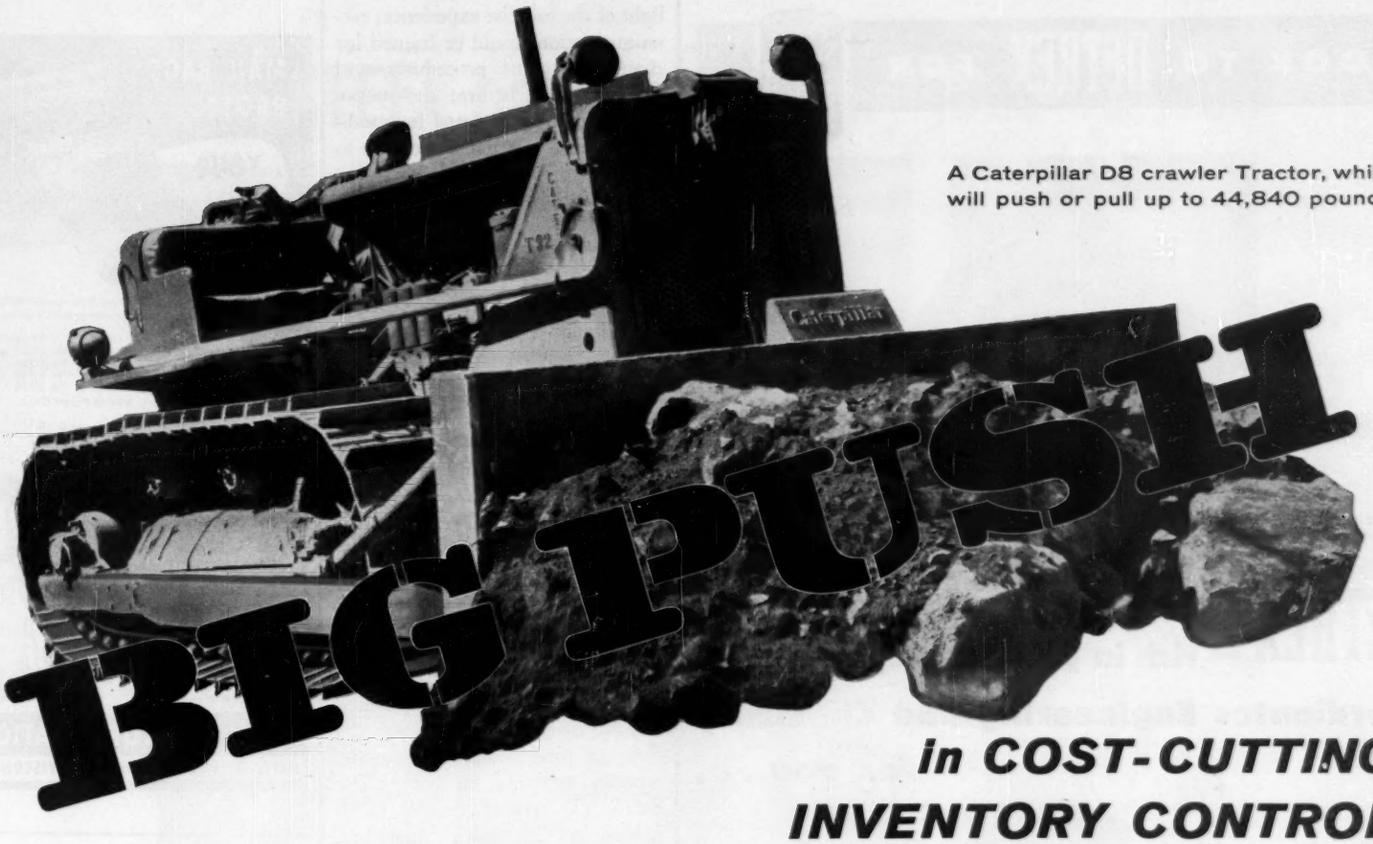


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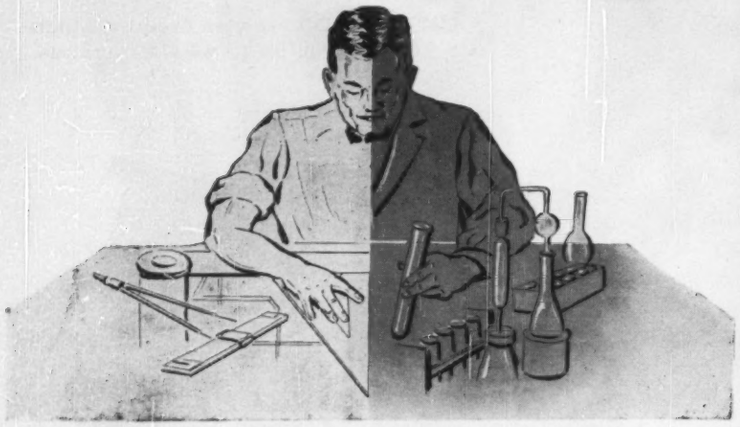

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structure could be evaluated in the light of the exercise experience; recommendations could be framed for changes in plans, procedures, and organization structure; and proposals could be formulated for modifying future war game exercises to make them more effective training instruments.

### Of Prime Importance

This skeleton description of a prototype civilian war game exercise should make it clear that one critically important and essential part of the project has been omitted from the statement. Successful conduct of the exercise will depend on extensive and imaginative preliminary staff work by personnel of ODM and co-operating government agencies. It would be the responsibility of this group to visualize and then to create the data and related information necessary to carry out a successful exercise. Required information would include:

(1) Projections of enemy-caused damage by industry and area; (2) data on total available industrial capacity analyzed in comparable detail; (3) related resource information on manpower, materials, construction equipment, components, and other facilities. The projections of enemy-caused damage should be organized as a sequential flow of hypothetical damage reports, presented in a form that would reflect the probable quality of emergency reporting. A major objective for the staff would be the achievement of a high degree of realism in the organization and presentation of three categories of information: (1) pre-attack policies, plans, and procedures; (2) resource

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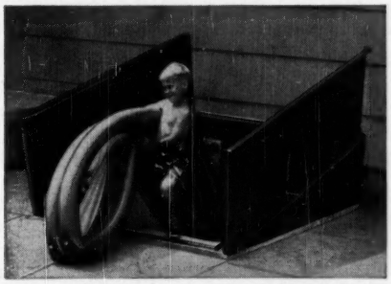

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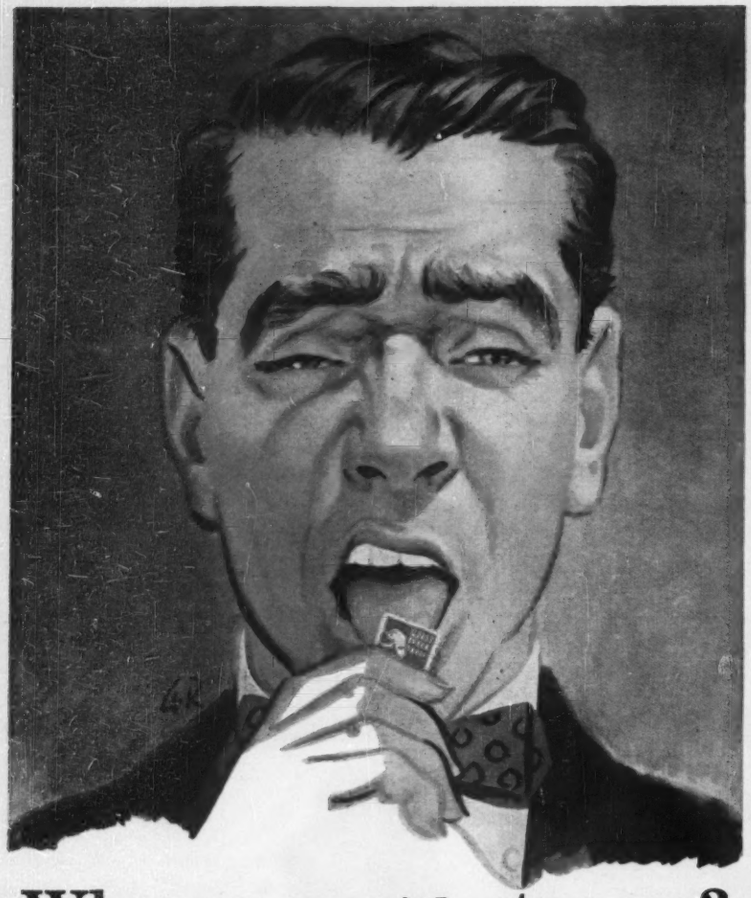
availability prior to the attack; (3) the extent of damage resulting from the hypothetical air strike.

Successive war game exercises could be conducted with a rotation of management personnel, the participants in each session including some veterans of previous exercises and some new men. In this way the essential experience would be spread among a growing number of persons in all parts of the country, thereby building a growing reserve corps possessing increasing skill and experience. Successive exercises could also serve as forums for exploring a wider variety of post-attack situations, as well as providing opportunities for testing changes in organization structure, reporting procedures, and methods of implementing decisions, as suggested by the results of each exercise.

### For Rapid Recovery

In any future war emergency, the key to this nation's survival and ultimate victory may be the ability of American industry to accomplish a rapid and rational recovery from the effects of bomb damage and to organize its resources for maximum production within a balanced mobilization program. Under the protected conditions of 1942 we were not able quickly to achieve a successful improvisation of mobilization management. There were gross errors and critical delays.

In the conditions that are likely to attend any future emergency, similar errors and delays might destroy our capacity to survive. No one who has seriously studied the role of industry in total war can fail to recognize that the ability to organize and direct the use of economic resources is at least as important as the possession of a bomber striking force capable of massive retaliation against attack. This judgment is reinforced by the belief of many military men that an atomic war might take the form of initial devastating air attack immediately followed by its counterpart in retaliation, after which the struggle would be carried on in a period of relative military calm while the two nations engage in a race to rebuild their strength by maximum industrial effort. If what we face bears any resemblance to this forecast, survival and victory can be assured only by our ability to man-

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● *And licking and sticking? Keeping them locked up in a stamp box? Running out of the right stamp values? Figuring out the postage account? Frequent trips to the postoffice? . . . You don't have to any more! Get a DM . . .*

● The DM is a *desk-model* postage meter . . . *prints* postage, the right amount for any kind of letter, directly on the envelope. Prints a dated postmark at the same time, and your own small advertisement if you like. Has a moistener for sealing envelope flaps. And even handles parcel post.

● Anybody can easily learn to use a DM in a few minutes. Just dial the amount of stamp you need, and press down the handle. Can be set for as much postage as you want to buy at one time, and postage in the meter is protected from loss, damage, misuse . . . Shows postage available, and amount used, on visible registers . . . Saves time and effort in mailing—and usually postage.

● Mail the modern, efficient way with metered mail! Call or write the nearest Pitney-Bowes office for a demonstration. Or send the coupon for free illustrated booklet.

**FREE:** *Handy chart of Postal Rates with parcel post map and zone finder.*

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*Offices in 94 cities in U. S. and Canada*

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YOUR AD HERE

*Please send free ☐ booklet, ☐ wall chart to:*

*Name* _____

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***with warehousing and distribution problems?***

Let Lehigh untangle things for you! With our 35 years' experience and unmatched facilities, we know most of the answers to storage and distribution questions.

We have facts marketers will welcome . . . evidence that may prove our services can be more efficient and economical than operating your own warehouse and trucks.

Our five modern warehouses and delivery fleets can put your products quickly into the rich New York metropolitan area. We also operate the huge Horseheads center in upstate New York, and others in Atlanta and Richmond. Our big tank farm at Bayonne, N. J. unloads bulk liquids, stores and repacks for distribution at a saving. Lehigh saves you year round operating costs; you pay only for services *as used*. Every manufacturer and shipper should know the Lehigh story. It's good business. Write, phone or wire.

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Telephones:
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APPLYING RECORDAK MICROFILMING TO OFFICE ROUTINES—NO. 9 IN A SERIES

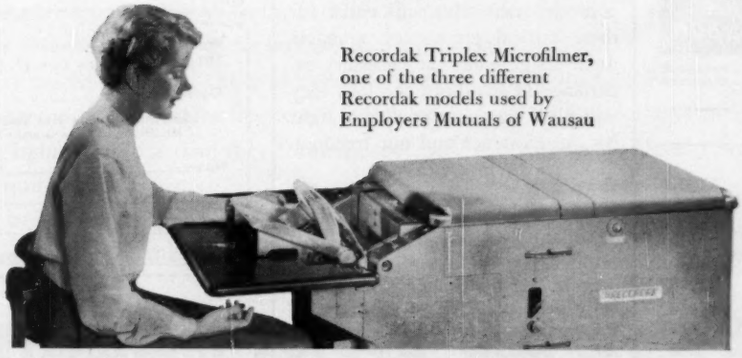
# Recordak Microfilming saves $10,000 per year in filing space and cabinets

## Saves thousands of clerical hours, too, at Employers Mutuals of Wausau

As many as sixty thousand documents are photographed on Recordak Microfilm daily at Employers Mutuals of Wausau, one of the world's leading mutual insurance firms.

This, of course, cuts filing requirements tremendously. But, more importantly, it speeds the handling of checks, claim records, invoices, purchase orders and other important documents. And it keeps this data at the finger tips—ready for immediate review in Recordak Film Readers. *All of which is reflected in the service and dividends to policyholders.*

Just another example, this, of the way Recordak Microfilming is cutting costs for over 100 different types of business, thousands of concerns.



Recordak Triplex Microfilmer, one of the three different Recordak models used by Employers Mutuals of Wausau

**See how Recordak Microfilming can help you:**

- ☐ If you are now transcribing information from one set of records to another
- ☐ If you are now posting data to ledger and customer statement
- ☐ If you are now describing individual purchases, credits, etc., on your bills
- ☐ If you are now making a record of checks prior to deposit in your bank
- ☐ If you are now making punched card reports in duplicate, or using multiple carbons in sales books, etc.
- ☐ If you are now making photocopies of records

These are only some of the possibilities. You should double-check your routines with a Recordak Systems Man soon. *No obligation, whatsoever*—just write Recordak Corporation (Subsidiary of Eastman Kodak Company), 444 Madison Avenue, New York 22, N. Y.

**RECORDAK**

*(Subsidiary of Eastman Kodak Company)*

**originator of modern microfilming—and its application to business routines**

*"Recordak" is a trade-mark*

Do Your Salesmen or Dealers Have These Problems?

They NEEDN'T ... if you use HEINN Loose-Leaf Binders

SORRY, BUT I'LL HAVE TO CONTACT THE HOME OFFICE FOR THE INFORMATION.
THE PRICES IN THIS CATALOG ARE OBSOLETE. SEE THE SEPARATE PRICE LIST... THE ONE MARKED 1307X.
I CAN'T SHOW YOU CATALOG DESCRIPTIONS OF THAT MODEL. BUT WE'LL HAVE A NEW CATALOG IN SIX MONTHS.
GLEASON
GLEASON WORKS
SALES & SERVICE MANUAL
Mall
MALL TOOL COMPANY
REPLACEMENT PARTS CATALOG
argus cameras, inc.

Selling material stays up to date and in sequence

When your salesmen and customers have Heinn Loose-Leaf Binders, you issue inexpensive, quickly printed sheets or supplements. These go into binders *in the proper place,* and Heinn-designed indexing helps every user "keep tabs" on necessary facts.

The complete story can be vital to your operation. Find out how Heinn can help you cut sales correspondence, shorten sales-call time, reduce selling expense, and make a better impression on customers. Ask for "Facts at Your Fingertips," Heinn's new copyrighted booklet that helps you select the correct basic binder and indexing.

*Be sure that your salesmen and dealers have quick access to all the product and policy facts a customer could want. Make it easy for the customer to buy — and it becomes easy to sell!*

He'd find facts in three seconds with Heinn indexing.

Representatives in many major cities

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310 W. FLORIDA ST.
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*Please give us facts about binders and indexes for:*

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| ☐ SERVICE, INSTRUCTION, PROCEDURE MANUALS | | ☐ SAMPLE CASES | |
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| ☐ PRICE BOOKS | | ☐ EASEL PRESENTATIONS | |
| ☐ PARTS BOOKS | | ☐ ACETATE ENVELOPES | |
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☐ *Have your representative call.*

ORIGINATORS OF THE LOOSE-LEAF SYSTEM OF CATALOGING
Leaders in 1896 ... and Still Leaders


age the post-attack emergency with skill, imagination, and efficiency.

In this context, American industrial management has an opportunity to make an important contribution to national security. This contribution is beyond its inherent massive production potential and its participation in long-range programs for dispersion of new production facilities outside prime target areas. It can help to create and maintain a reserve corps of competent management specialists, prepared to serve in responsible mobilization and stabilization positions in the event of emergency. It can encourage and support training programs for the members of the reserve, and can agree to the terms of service therein that will be necessary. The war game exercise will utilize the time and skills of these men. Like the use of pilot plant operations as a transition from the laboratory to full-scale production, it can be an effective way to identify and correct operational deficiencies. At the same time it can give the men who will enlist for these critical emergency management assignments the necessary experience in handling the jobs they will fill if we are compelled to fight for our existence and our freedom.

THE END

*The* AUTHOR

Melvin Anshen, Professor of Industrial Administration at the Carnegie Institute of Technology, has spent a large part of his life in academic surroundings, but Government experience has given him vast knowledge of the problems of industrial mobilization.

He received his AB from Harvard and went on to take an MBA at Harvard Business School and later a DCS at the same institute. While Professor of Marketing at Indiana University, he acted as consultant to many Government agencies and business concerns.

From 1942 to 1946, Professor Anshen served in various capacities on the War Production Board ending as Director of the Research Staff. In 1951 he returned to Government circles to serve as Acting Deputy Administrator for Program and Requirements in the Defense Production Administration.

*The writer acknowledges the valuable assistance of members of the staff of the Office of Defense Mobilization, and its Mobilization Program Advisory Committee. The views expressed in this article are the views of the writer, however.*

*New booklet tells how a bad spill (and a glib Gremlin) introduced Mr. Higby to the* LEGGE *System of Safety Floor Maintenance*

Maybe you've never met a Gremlin, head-on.

Even so you'll want to chuckle your way through "Mr. Higby and the Gremlin". It's our *brand new* 16-page booklet, loaded with important facts about *your* floors and their upkeep. It is colorfully illustrated, entertainingly written.

Learn how you can eliminate wasteful maintenance practice; cut your costs for materials and labor *way* down; prevent slip-accidents and the law suits that follow.

It's all there for you to read in "Mr. Higby and the Gremlin". Absolutely FREE. No obligation at all. Compliments of

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*Branch offices in principal cities. In Toronto J. W. Turner Co.*
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Gentlemen:

Send me your new Free booklet, "Mr. Higby and the Gremlin".

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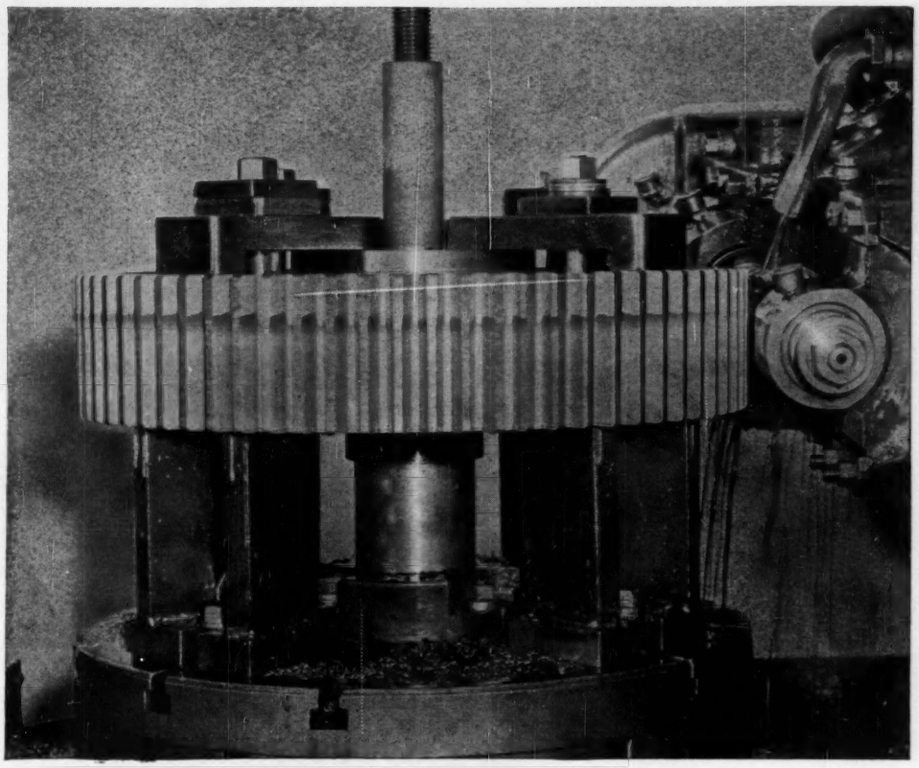
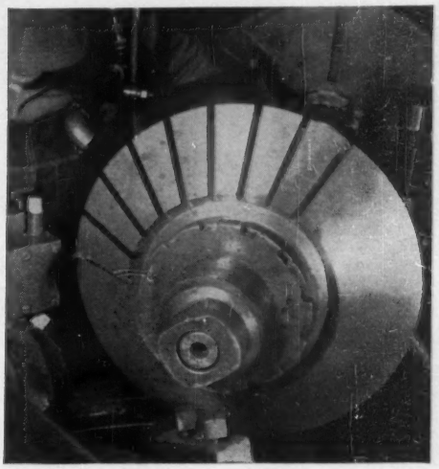


◀Machining an axle gear at the plant of Goodman Manufacturing Co., Chicago. Widely known for its mining equipment, Goodman is a regular user of Bethlehem forged-and-rolled gear blanks.



▲Many firms make strong bevel and miter gears from Bethlehem blanks.

# How to make a STRONG Gear and still keep its weight down

Goodman shop craftsman tests a finished gear with master pinion.

Often the first problem in gear design is to achieve high strength with a minimum of weight. Bethlehem supplies an answer to this common problem with its forged-and-rolled gear blanks, which are available in sizes from 10 to 42 in. OD.

Forged-and-rolled means just what it says. The blanks are processed in a unique mill that combines the steps of forging and rolling, with the attendant benefits of both. Each blank has the density and compact internal structure of forged metal, plus the smooth grain flow of a rolled product. The end result is strength—high load-bearing strength. Thus users frequently find it possible to employ thinner, lighter sections than they formerly specified, and still meet every requirement.

Also, because of their good grain flow, uniform density, and clean, homogeneous metal, the blanks are very easy to machine. Cutting speeds are frequently higher, and finish-machining can often be accomplished with fewer cuts.

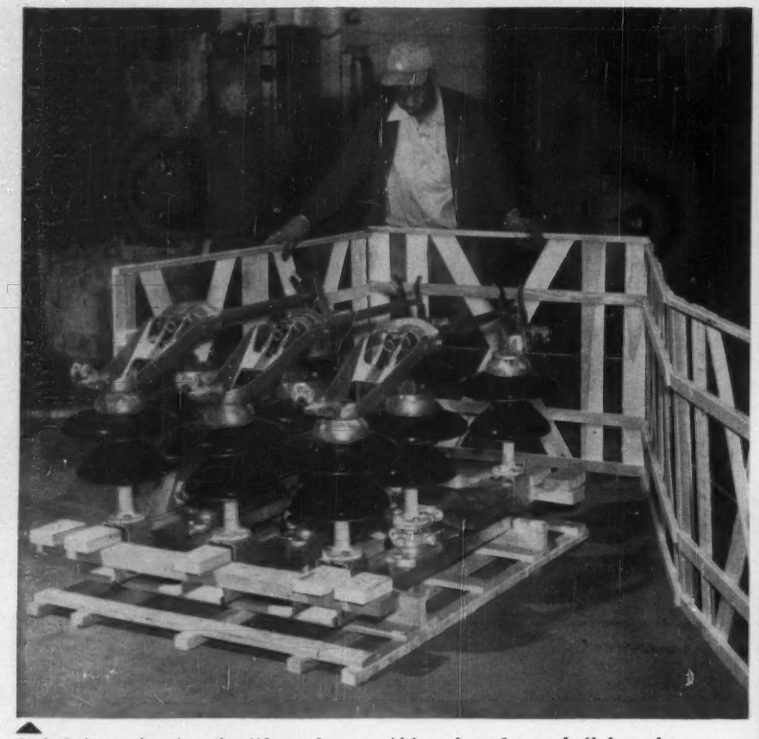
If you manufacture spur, bevel, miter, herringbone, or other types of gears, Bethlehem's forged-and-rolled blanks can lead to important economies. Please remember, too, that they are excellent for sheave wheels, industrial wheels, turbine rotors, clutch drums, tire molds, and numerous other circular steel products.

Many details—and almost 100 pictures—are to be found in Booklet 216, which is yours for the asking. Write today for a free copy of this informative booklet, addressing request to Bethlehem Steel Company, Publications Dept., Room 1037-A.

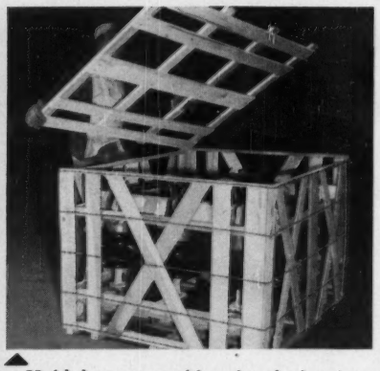
BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

*On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation*

## BETHLEHEM Forged-and-Rolled CIRCULAR FORGINGS



Switch is set in place by lift truck on pallet base specially designed to permit use of same crate for switches of two sizes. Wirebound mats wrap around easily, are secured in minutes.



Hold-down assembly, already in place here, goes on next. Then top is placed in position and nailed. All parts fit nicely, reinforcing each other for strength and easy assembly.

Although 106 pounds lighter than previous container, which was custom built for each switch, rugged engineered wirebound permits fork lift handling and stacking of 759-lb. gross weight units.

# Prize-winning General-Engineered Wirebound Cuts Packing Time 85% for Delta Star

**This wirebound crate won first award for excellence of design for Delta Star in the 1954 competition sponsored by the Society of Industrial Packaging and Material Handling Engineers, the 6th consecutive first for containers by General Box.**

The change from a custom-built crate to a General wirebound design cut packaging time for high-voltage disconnect switches from 3½ hours to ½ hour and reduced gross shipping weight 106 pounds per unit—from 865 to 759 pounds. These important savings were accomplished by Delta Star Electric Division, H. K. Porter Company, Inc., of Pittsburgh.

Skilled labor was required to build the crates formerly used, while the precision-made parts of the new wirebound are put together by unskilled labor. A bit of ingenious design that makes the crate quickly adaptable to another size switch permits standardization. There is a further saving in the lower cost of the materials in the General wirebound, an improvement in the degree of protection afforded—thanks to engineered and tested design—and an improvement in the appearance of the container.

Specialized experience and design and testing facilities unmatched in the industry are applied to the creation of custom-designed, volume-produced containers by General Box. To find out how much better your packaging can be, have a General man call. No obligation. Consult your local directory, or write direct. Ask for your free copy of illustrated booklet "The General Box."

**Factories: Cincinnati; Denville, N. J.; East St. Louis; Detroit; Kansas City; Louisville; Milwaukee; Prescott, Ark.; Sheboygan; Winchendon, Mass.; General Box Company of Mississippi, Meridian, Miss.; Continental Box Company, Inc., Houston.**

**Engineered Containers for Every Shipping Need**

• Wirebound Crates and Boxes • Generalift Pallet Boxes • Corrugated Fiber Boxes • Cleated Corrugated and Watkins-Type Boxes • Stitched Panel Crates • All-bound Boxes

**General Box**

**1813 Miner Street, Des Plaines, Illinois**

★ ★ ★ ★ ★

# FILMS
## *for Management*

AS THEY have in recent years, business men will probably spend more to sponsor films in 1955 than ever before. Most film producers are looking ahead to a bonanza year as business men become increasingly interested in the film as a versatile tool for sales training, sales promotion, public relations, and safety, technical and economics education, and many other tasks.

### *Reel Briefs*

***Univac*** (23 minutes, b&w). While millions of citizens are quite familiar with Remington Rand's Univac as an election-eve Nostradamus, few have seen the giant brain performing its everyday function of processing data for American industry. This low-budget film, produced by Seymour Zweibel Productions, Inc., of New York, manages to explain quite lucidly for the layman what appears at first to be almost inexplicable—the functions of servo-mechanisms, electronic tape, memory systems, and other intricacies of the equipment.

It takes the viewer on a detailed tour of a Univac installation, several of which are already in use, and demonstrates such savings as the reduction in preparation time on a payroll from seven days to four hours. Factory production scheduling which previously required three weeks of preparation can now be done in 20 minutes, after the programming has been accomplished.

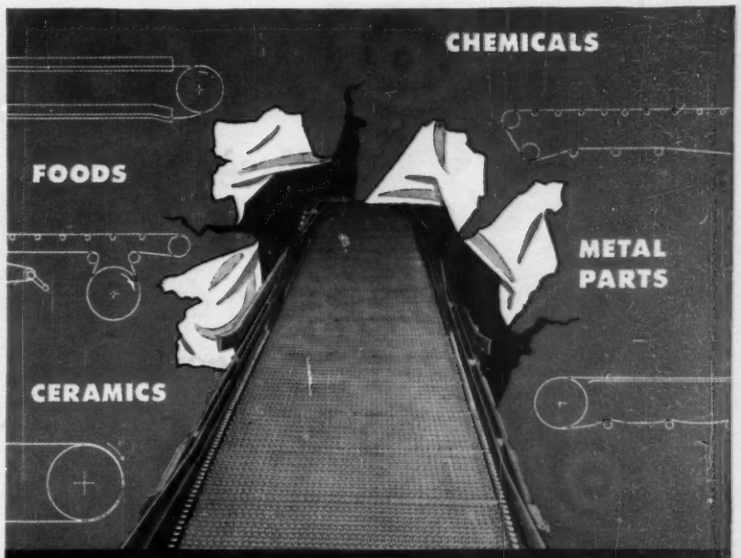
A sales promotional film of this nature is virtually unavoidable when the product is not exactly portable, is extremely intricate, and sells for about $1 million. A print of this informative film can be borrowed free from the Visual Aids Department, Remington Rand Inc., 315 Fourth Avenue, New York 10, New York.

***Chemistry Works for You, Right Down to the Finish*** (20 minutes, color). Some of the most fact-packed pictures are those which manufacturers produce for their jobbers and distributors. This is certainly true of the new promotional picture which Du Pont is presenting to its jobbers to help them boost the sales of paint products to the thousands of automotive refinishers, including industrial fleet operators, throughout the nation.

By taking an owner of a refinishing business on a tour of Du Pont's Marshall Laboratory in Philadelphia, the film demonstrates how to solve many of the perplexing problems of painting such as pinholes, adhesion, blushing, and others. The film is being shown along with various selling aids to paint jobbers who, in turn, are asked to set up showings for their customers and prospects in the refinishing business. Along with valuable how-to-do-it information, the film contains a gentle admonition to use Du Pont undercoating, the sales of which are considerably less than that of outer finishes. Produced by Transfilm Inc. of New York, the film is available through local Du Pont paint jobbers.

***Milk for the City*** (27 minutes, b&w), one of the most distinguished informational films yet produced by American industry, should be a serious contender for various awards this year. More important than awards, however, this film promises to attain the goals for which it was made. H. P. Hood & Sons, the largest milk company in New England, sought to increase the public's awareness of the intricate and delicate operations involved in placing a quart of milk at the customer's door. Since it can capture complicated processes and span space and time while holding an audience's undivided attention, a film was chosen to carry the message.

This plant tour begins on the farm and traces with most dexterous camera-work the complicated ways of channeling milk from the cow to the consumer. The company isn't looking for an immediate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**COMBINE MOVEMENT AND PROCESSING WITH**

*Cambridge*

**WOVEN WIRE CONVEYOR BELTS**

Whether it's copper brazing at 2050° F or flash-freezing at sub-zero temperatures, all-metal woven wire conveyor belts can help cut your operating costs and increase production by eliminating profit-stealing batch handling with continuous uniform processing at controlled rates of speed.

Cambridge Woven Wire Conveyor Belts are individually designed for your installation from a wide variety of specifications. The metal or alloy from which they are woven is specially determined after investigating the resistance to heat or corrosion required by your operating conditions. Uniform continuous construction minimizes uneven wear, localized weakening and costly shutdowns. Open mesh, also selected according to your requirements, cannot trap spilled materials . . . reduces clean-up time.

No matter how you look at it, CAMBRIDGE Woven Wire Conveyor Belts are invaluable aids to AUTOMATION . . . help beat your biggest competition, COST!

**COPPER BRAZING is performed continuously at temperatures of 2050° F on this Cambridge woven wire belt.**

*Ask your Design Department to call in your Cambridge Field Engineer to study your processing and discuss ways to cut costs by combining movement with processing. Your engineers can rely on his advice. The Cambridge man nearest you is listed under "BELTING—Mechanical" in your classified telephone book.*

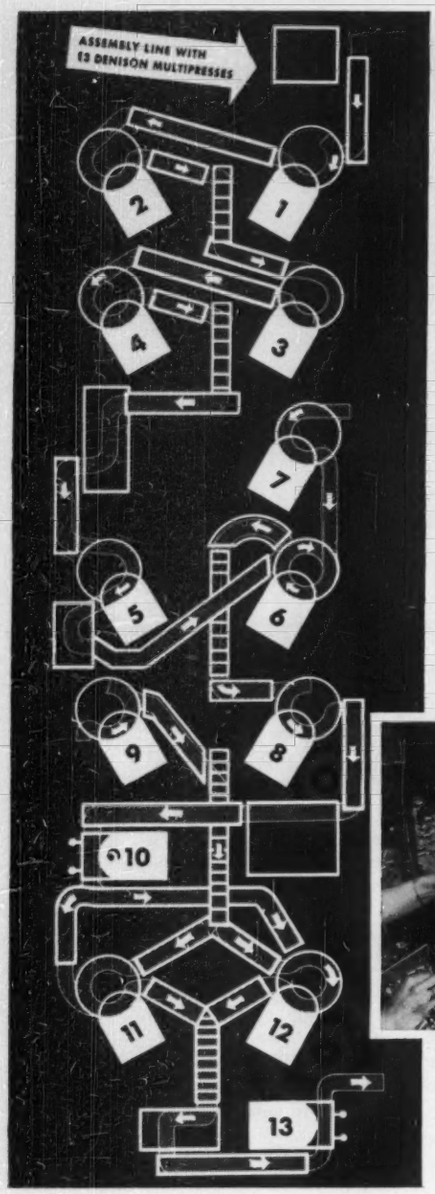
**Write for your PERSONAL COPY of 130-PAGE REFERENCE MANUAL illustrating and describing woven wire conveyor belts. Gives mesh specifications, design information and metallurgical data.**

**The Cambridge Wire Cloth Co.**

WIRE CLOTH | METAL CONVEYOR BELTS | SPECIAL METAL FABRICATIONS

DEPARTMENT Y, CAMBRIDGE 2, MARYLAND

**OFFICES IN PRINCIPAL INDUSTRIAL CITIES**

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13,000
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per day
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**DENISON MULTIPRESS®**

*Loading for staking of five-part sub-assembly*

THIS COMPANY set out to assemble 10,000 auto door-latches per 16-hour day . . . beat its goal by 3000 with Denison Multipress.

With a line of 13 Denison hydraulic Multipresses, Reid Products Division of The Standard Products Company assembles 13,000 door-latches – 34 pieces per latch.

Parts are carried on conveyors and chutes. Operators load component parts on Denison Index Tables which position them under the hydraulic ram up to 70 times a minute.

Assembly line takes up only 500 square feet.

If you have a problem in automatic operation . . . or any job that calls for controlled pressures up to 75 tons, bring it to Denison. Write to:

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PUMPS • MOTORS • CONTROLS

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fillip to milk sales, but in the long run, milk consumption should be bettered by a public relations effort of this nature. Produced by MPO Productions of New York, it is available only in New England from Modern Talking Picture Service, 235 Stewart Street, Boston 16, Massachusetts.

***The Transistor*** (10 minutes, b&w) is a fast-moving biography of the mighty midget which promises to play a pivotal (though behind-the-scenes) part in the dramatic changes which are coming to American industry. This informational film which was produced for the Bell System by Transfilm Inc. of New York, is the first motion picture devoted entirely to the new device which was born in the Bell Telephone Laboratories in 1948.

While the immediate use of the transistor has been in communication equipment, other segments of the electronics industry—calculators, control equipment, testing devices—are listed among those affected by the new device. That it may soon shoulder aside its chief rival, the vacuum tube, is indicated by the distinct advantages of the transistor, which is less costly to make and maintain, produces less heat, uses far less power, and most important, aids immeasurably the development of miniaturization.

Both the advantages and future use of the transistor are clearly outlined in this public service film from the Bell System, probably the largest user of films in American industry. It can be borrowed free from your local Bell Telephone Company business office.

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We'd be happy to send you lists of 16-mm. motion pictures on:

- *Sales training*
- *Management methods*
- *Manufacturing techniques*
- *Human relations*
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- *Work simplification and motion study*
- *Employee training*


*Mr. Executive!*

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**COMPARE**
*(Based on 25,000 Miles Per Year)*

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FLEETS OF 25 TO 5,000 FORDS, PLYMOUTHS, CHEVROLETS

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**MOBILE LOADING RAMPS**

*a loading dock on wheels!*

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A loading dock on wheels! Where you want it . . . when you want it! Services yard cars or highway trailers. Lightweight—easily moved about. Hydraulic lift positions it. Use as a dock or as an auxiliary unit to relieve overtaxed dock facilities. They're practical, economical, and efficient! Get the facts today.

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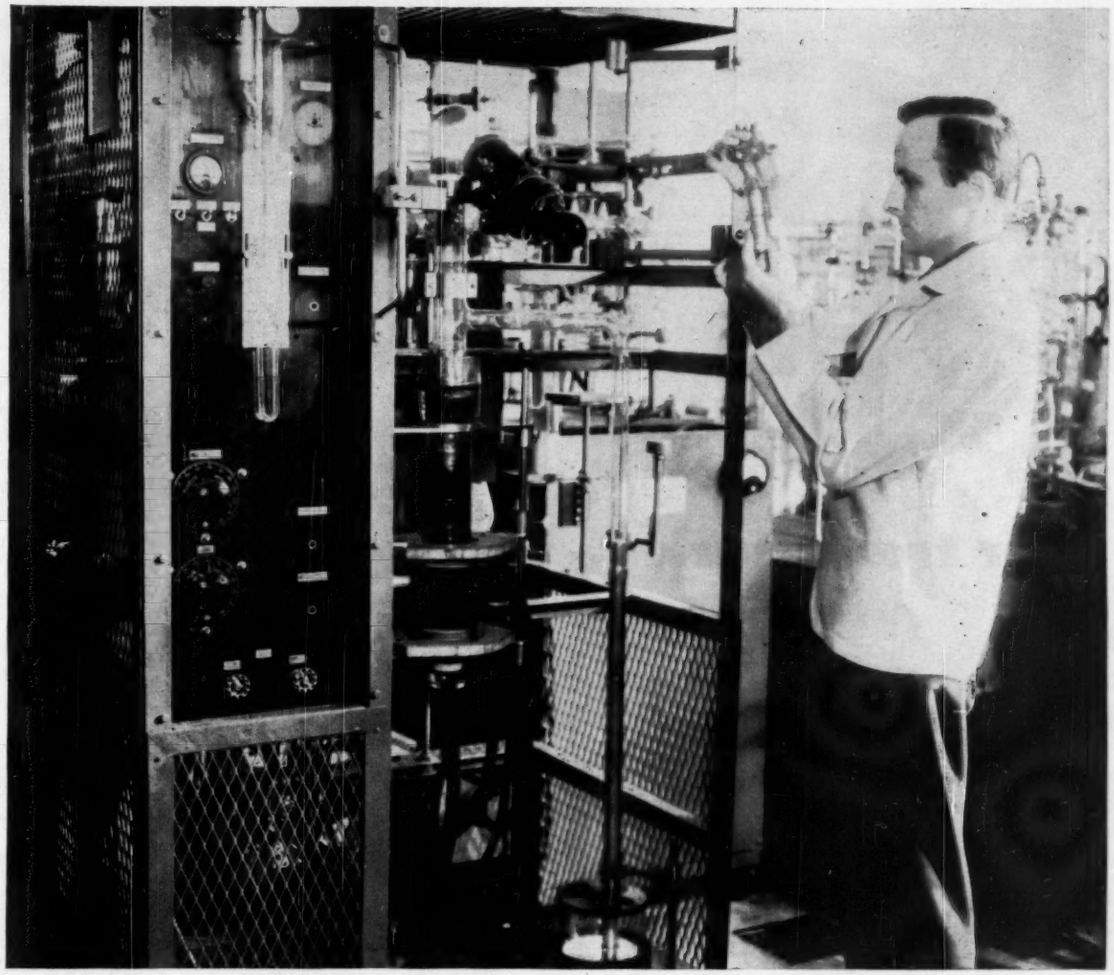
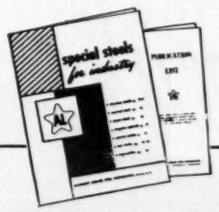


# They search so that you may find

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Dept. D-4, Bradford, Pa.

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# Executive BOOKSHELF

## *Lowering the Barriers*

In the recent booklet, *Free Trade, America's Opportunity*, the most persistent arguments for tariff protection are neatly demolished by economist Leland B. Yeager. Tariff reduction, one of the thorny issues for the new Congress, is apparently gaining support among business men. However, many manufacturers look upon free trade proposals as unpleasant medicine which may be good for other producers but doesn't apply to them for their situations are "somewhat different."

Other business men see a double incentive for tariff reduction, in that it opens up foreign markets, so necessary when productive capacity is outrunning domestic consumption, while simultaneously enabling other nations to earn dollars to enter our domestic market. Whether one is a tenacious protectionist or a free-and-easy free trader, he will be pleased by the refreshing, informal approach to an intricate problem.

*Robert Schalkenbach Foundation, 50 East 69th Street, New York 21, N. Y., 88 pages, 25 cents.*

*Continued on page 72*


"National" TRUCK LEASING EXPERIENCE IS AVAILABLE TO YOU locally!

Truck users! You will be pleased with our all-service truckleasing.
America's leading firms utilize the efficiency of our specialized facilities. Forget your problems of replacement, breakdowns, repairs, insurance, licenses, paper-work, road calls, tied-up capital and extras. Know your costs in advance. Let us engineer your fleet to fit your exact needs.

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Look up National Truck Leasing System in your local 'phone book, or write for brochure and listing of NTLS companies. Dept. D-2

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Even before you rent, you can have a *10-Day Free Trial* . . . to prove for yourself how the versatile OLD TOWN Duplicator cuts paper work and saves both time and money. You'll find hundreds of applications — from sales letters, bulletins and reports to simplified billing and control systems — make all the copies you need of everything you can type, write or draw in 1 to 6 colors.

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Model 711 CR

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### *To Produce Enthusiasm*

Clarence Francis of General Foods, once said that "you can buy a man's time; you can buy a man's physical presence in a given place; you can even buy a measured number of skilled muscular motions per hour or per day. But you cannot buy enthusiasm; you cannot buy initiative; you cannot buy loyalty; you cannot buy the devotions of hearts, minds, and souls. You have to earn those things. . . ."

How one concern, the Jewel Tea Company, has earned the enthusiastic loyalty of its employees is described in detail in the new booklet, *Sharing a Business,* by Franklin J. Lunding, one of the company's executives. The author stresses those intangibles over and beyond high wages and personal security measures which enable employees to identify their goals with those of management. Not a dry and dreary case study, this booklet offers a step-by-step prescription for boosting executive effectiveness and sharing both the boons and banes of a business.

*Updegraff Press, Harwood Building, Scarsdale, N. Y., 65 pages, $1, discounts on ten or more copies.*

### *How to Be a Foreigner*

When American corporations extend their operations to other nations, they are sometimes accused of siphoning off valuable raw materials for the American economy. To answer the canard of economic colonialism and to offer guidance for the proposed plans to export American capital, Professors Eugene W. Burgess and Frederick H. Harbison made a detailed and searching study of the operations of W. R. Grace & Company in Peru.

Entitled *United States Business Performance Abroad: The Case Study of Casa Grace in Peru,* this book demonstrates for the general reader how profit-making is being combined with social improvement in underdeveloped areas. The second largest employer in Peru, Casa Grace has extended its operations through an entire spectrum of activities, designed to develop industry and products for the domestic Peruvian markets.

Grace's success formula includes a strong awareness of the need to raise living standards, to respect native traditions, and to provide wide-


**How To Build Profit Value In Your Sales Dollars**

**JOHN D. CORRIGAN.** Nationally consulted sales analyst shows you how any company can improve performance at each management level for higher profits. Explains "profit-power" formula for analyzing product, pricing methods, selling policy. Describes proved incentives for better personnel performance. *242 pp.* **$3.95**

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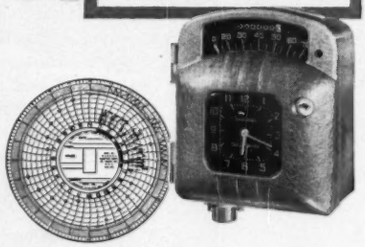

Thousands of fleet operators have found that Tachographs do put efficiency into their modern, over-the-road trucking operations and improve their safety records. Tachographs have done much to cement the good relations between drivers and owners. Drivers, who at the outset shunned Tachographs, are singing praise for these recording speedometers because they verify good driving and protect them against false speeding charges. The recording charts are helpful to fleet operators, too, because they give a graphic record of every trip. This information is valuable in compiling mileage, fuel, tire and repair records so necessary in profitable truck operations.

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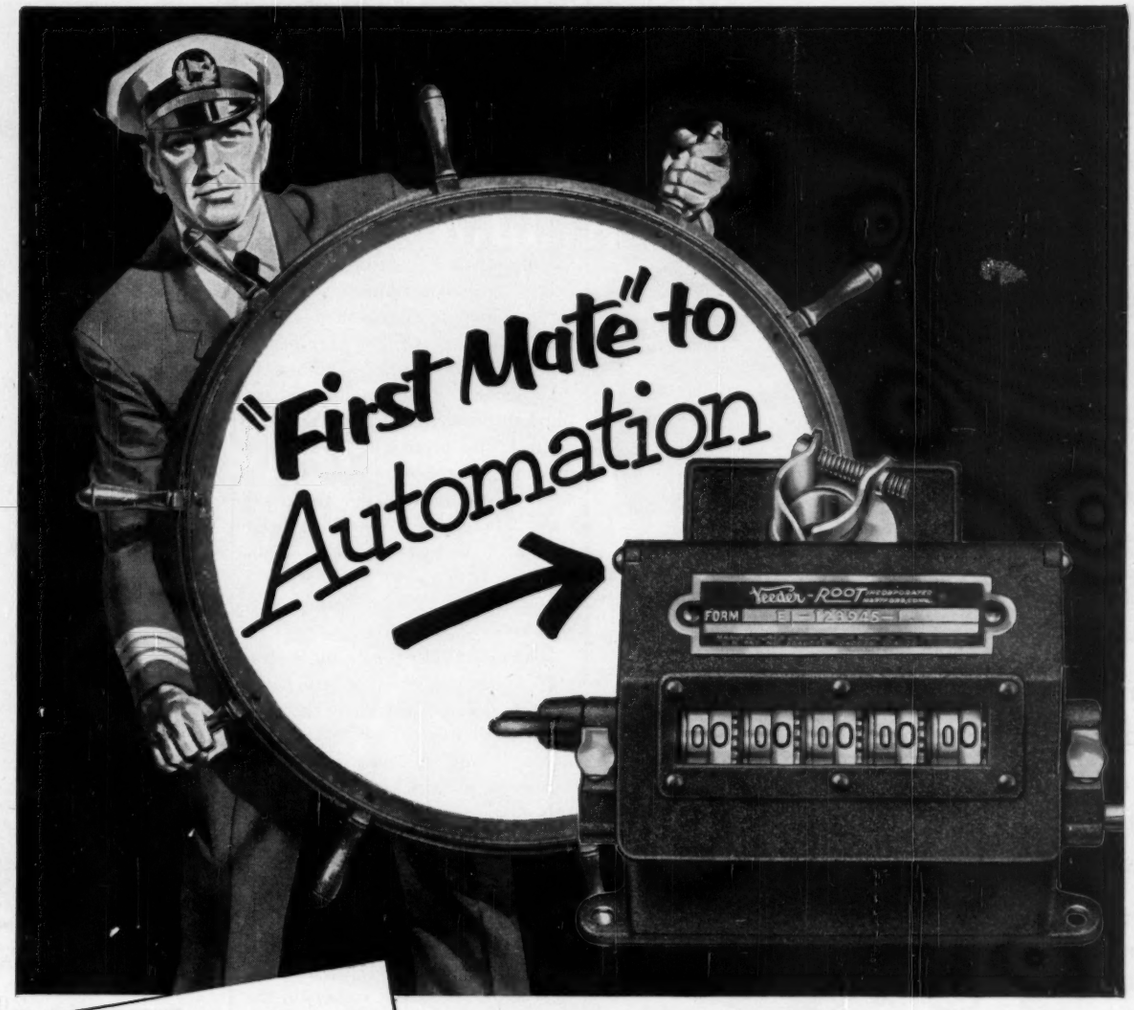


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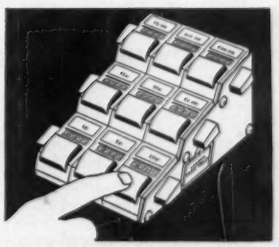

New *Vary-Tally* Multiple-Unit Reset Counter comes in any combination up to 6 banks high, and 12 units wide. Write for news sheet and prices.

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WATSON (established in 1887) also builds a complete line of filing cabinets and courthouse, bank and hospital equipment.


open promotion possibilities for Peruvians. Of the 2,019 employees in the Grace offices in Peru, only 115 are not Peruvians. But even more striking: of the top ten Grace executives, six are natives of Peru.

*National Planning Association, 1606 New Hampshire Avenue, N. W., Washington 9, D. C., 112 pages, $1, discounts on ten or more copies.*

## *Sound Approach*

Along with electronics, nucleonics, and automation, another term, sonics, is taking its place in the vocabulary of the technically minded business man. Defined as "the technology of sound as applied to problems of measurement, control, and processing," sonics offers manufacturers in many lines a new approach to many troubling tasks. Inaudible sound has been used to shape metals, process chemicals, as an abrasive, and to probe the inner structure of various materials.

The new book, *Sonics,* by Professors Theodor F. Heuter and Richard H. Bolt of M.I.T., is the first attempt to bring together for the non-specialist in acoustics the advances in principles and practises in this new field. The reader need not be versed in the theory of acoustics, but training in engineering or some related science is certainly a requisite for finding one's way through the many equations and diagrams. The book's emphasis is not on practical applications but rather on the principles behind the particular applications in such fields as chemicals, engineering, metallurgy, food technology, and many others.

*John Wiley & Sons, Inc., 440 Fourth Avenue, New York 16, N. Y., 456 pages, $10.*

## *Free Catalog*

The sights if not the sounds of the most recent National Business Show can be recreated through the comprehensive *Catalog of the Newest and Best Products and Services for Modern Management.* Offered as a service by the exhibitors at the National Business Show in New York, this hefty volume (which is two inches thick and weighs several pounds) brings together brochures and other informational literature on the latest products and services for the office. It is free from the National Business Show, 33 West 42nd Street, New York 36, N. Y.

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Two months in action in leading industries, and in the users' own words, the Monro*Matic Duplex is years ahead!

From an electric utility: **"Just what we needed for years... saves hours."**

**"Great for payroll... impressed by its simplicity,"** says oil company.

**"Nothing like it for our type of figure work,"** from foundry.

**"Invaluable for accumulating results,"** says box manufacturer.

The list is endless in praise of the new Monro*Matic Duplex. Companies large and small find it gives them *total automatic figuring!* The Monro*Matic Duplex begins where other calculators leave off. It adds *as* it multiplies. Adds *as* it divides. And, all important, it stores those answers for your later use. No need to re-do the whole problem later, step by step.

Yes, the Monro*Matic Duplex puts the modern miracle of automation to work for you, cuts through the toughest figuring work faster, more accurately, with fewer steps.

Ask your Man from Monroe for the whole story. Have him show you, on your own work, how the Monro*Matic Duplex reduces all figuring to feeding figures, pushing buttons. Monroe Calculating Machine Company, Inc., Orange, New Jersey. Branches Everywhere.

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Colitho Plates — plain or preprinted — can be adapted to any business form. The original typing prepares the plate which is run off on an offset duplicator. Form and fill-in are reproduced in perfect register — cleanly — legibly.

This case history demonstrates the economy and efficiency that countless businesses now enjoy through the use of Colitho Plates. We have a collection of these factual stories which you will find packed with valuable ideas. May we send them to you? Use the coupon and you'll receive your copy of the Colitho Idea File promptly.

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## EXECUTIVE

*Continued from page 38*

problems with the assurance that universal executive participation in discussions will result in those executives being alerted and conditioned to changes.

The importance of selection, editing, and provocative presentation of case materials cannot be overemphasized as a prerequisite to a good short session. Using current published information, sixteen business cases and collateral reading material were prepared. These involve such policy decisions as:

1. A carpet company which proposed to meet declining sales by a second line through a separate sales organization and adding cheaper cotton and synthetic fibers.

2. A floor tile manufacturer loses relative competitive position and sees danger signals even though total sales are maintained.

3. A paper manufacturer experiencing excessive turnover of salesmen experiments with aptitude tests.

4. A large manufacturer of automobile electrical accessories analyzes its product and merchandising costs, and considers major alterations in existing sales, product, and pricing policies.

5. A wholesale drug company doing over $300 million in annual sales faces problems of servicing thousands of unprofitable-sized accounts.

6. A complete marketing plan was required for a large foreign manufacturer entering a very competitive domestic market.

7. A major rubber company overhauled methods of recruitment, training, and personnel development.

In most cases real company names were used, and actual data secured from trade sources. A typical case that aroused unusual interest and discussion dealt primarily with changing consumer preferences, decentralized production to meet regional competition, and important revisions in pricing. The cut on page 38 gives an idea of how the case study is presented to the men.

Many of the 22 executives, ranging in age from 34 to 58, had not been in classrooms since leaving college—perhaps over 20 years earlier. The University vice-president added a formal academic touch by welcoming the group, expressing


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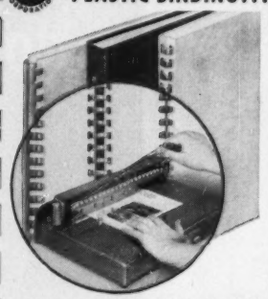

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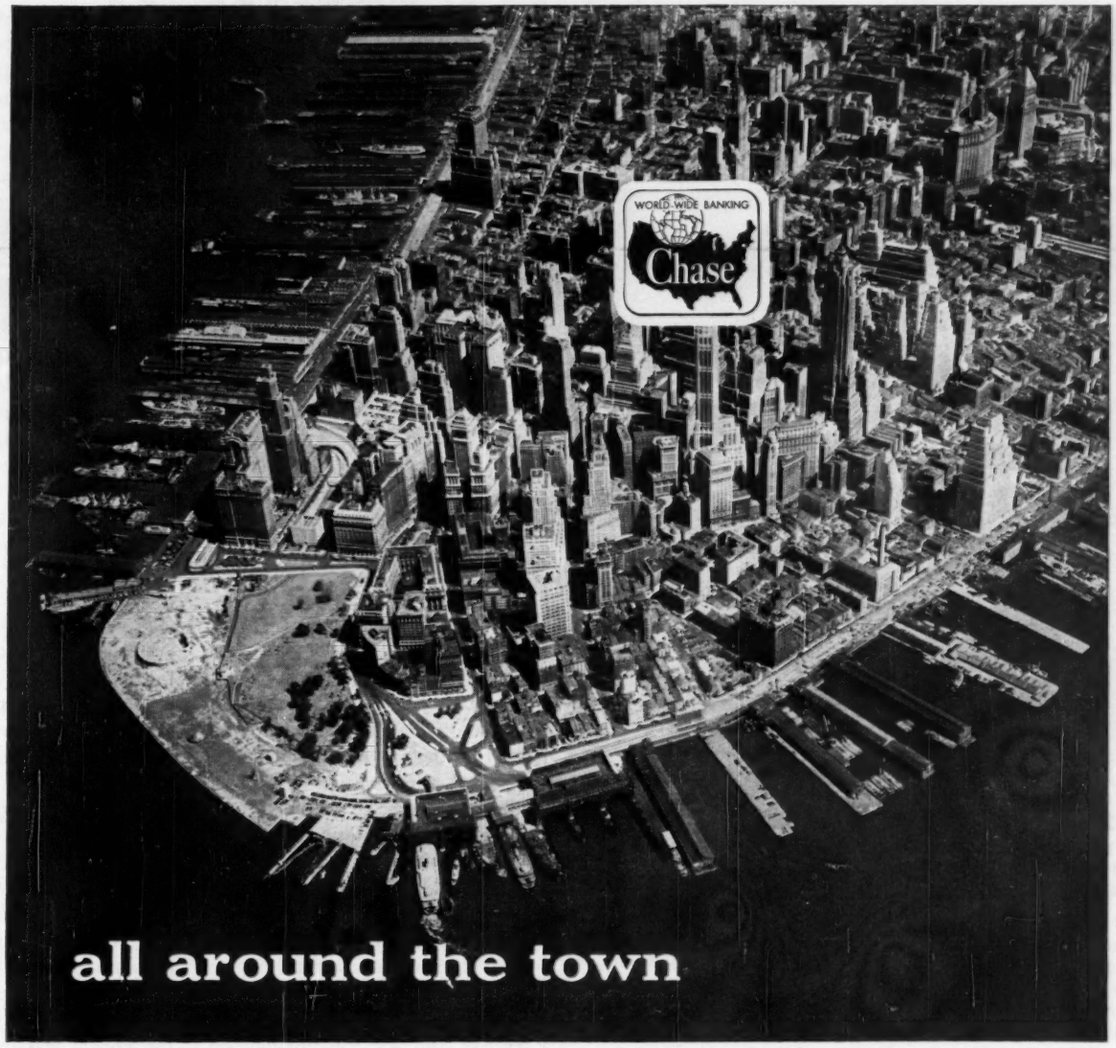


East Side, West Side—piers, hundreds of them, provide New York with the greatest harbor facilities in the world. Ocean-going vessels, docking at the rate of 12,000 a year, have made the Port of New York a gigantic funnel through which pours about half of America's trade with the rest of the free world.

It's no accident that the financial and shipping districts are located side by side in downtown Manhattan: *they work hand in hand.* The "Big Three" of foreign commerce—the importer, the exporter and the transporter—all depend upon commercial banks that are organized to serve the financial interests of customers on a national and international scale.

Such a bank is Chase National with headquarters in the center of New York's financial and shipping districts. From here, Chase service reaches out through its correspondent banks (the most extensive system in the U. S.) into all 48 states. Overseas, Chase has branches and representatives' offices in Europe, the Far East and Latin America and, in addition, maintains close working relationships with leading banks in the markets of the world.

*If you have a foreign trade problem, why don't you talk to the people at Chase?*

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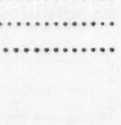

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his keen interest and the University's desire to co-operate with industry by furnishing facilities for this experiment in executive development. While the Forum might have been held in a hotel or office building, the retreat from telephones, interruptions, and other distractions were all plus-factors.

After introductory orientation talks, the first two case discussions were led by men who had previous case method experience. Thereafter students took turns as discussion leaders. By the end of the first day it was gratifying that the discussion leaders kept the discussion moving smoothly, picked up and guided questions, held discussion to the case, used the blackboard to focus attention to the problems and, finally, brought the case to a summary, if not a unanimous solution.

Any apprehension as to leadership and group participation happily was unwarranted, although—as could be expected—the group and leadership performance improved throughout the week as to intercommunication of ideas and cogent expression. Because the cases were not hypothetical but real, students appeared to recognize a responsibility for well-conceived and serious alternative solutions. As individual opinions and judgments were challenged, the participants learned to give and take while the discussion leaders became more adept in directing and moderating.

On the fourth day of our Forum we departed from cases to gain perspective and stir the imagination. There were two interesting speakers from leading chemical companies who outlined developments and made long-range predictions. Then followed a color film depicting the horizons in chemistry as applied to alkyd and other resins in industries ranging from automobiles, textiles, and furniture to paint. A company technical expert demonstrated some research projects. A sales training film of a major petroleum company was shown as a model of visual training.

Finally, Dr. Vergil Reed gave an address entitled "Changes in Your Market and How You Get There." Each guest speaker was scheduled with ample time to invite group discussion. Apparently case discussion habits had already had their effect, for each speaker was called upon to more than double his contribution answering questions.

Before appraising this program it is pertinent to consider the actual out-of-pocket cost. Travel and expenses for 22 men, as well as other incidental costs, totalled $3,940 for this full week's session—approximately $180 per man. The year before we had sent three men to a university session for a period of three weeks at a cost of $600 each—which, when added to travel, meant an expenditure of $1,950 and nine man-weeks.

To accomplish this for the group of 22 men who were selected for our Forum would have required a total expenditure of at least $14,300, plus 66 man-weeks away from the job. While making no assumption or comparison on the caliber of instruction or the time expended (one week versus three), it appears that the Forum was more practical for our purposes and had the added intangible value of building a company point of view.

THE END

*Frontispiece*

*Transliteration of the last page of*

WASHINGTON'S FAREWELL ADDRESS

Relying on its kindness in this as in other things, and actuated by that fervent love towards it, which is so natural to a man, who views in it the native soil of himself and his progenitors for ~~four~~ several Generations; — I anticipate with pleasing expectation that retreat, in which I promise myself to realize, without alloy, the sweet enjoyment of partaking, in the midst of my fellow citizens, the benign influence of good Laws under a free Government — the ever favourite object of my heart, and the happy reward, as I trust, of our mutual cares, labours and dangers

continuation of the paragraph preceeding the last, ending with the word real.—

United States
19th. September } 1796

G°: Washington

# IT TAKES *More*

# THAN A BUILDING

# TO PRODUCE INDUSTRIAL *busy-ness*

### ✓ Versatile Labor

Georgia's vast industrial growth demonstrates the Georgia worker's intelligence and ability. Georgia provides many advantages for a healthful life, with unlimited facilities for recreation and better living.

### ✓ Water & Power

Abundance of soft water supply. Coal is nearby, natural gas is increasingly available. Electric power is plentiful and reaches every community in Georgia.

### ✓ Industrial Sites

Georgia's amazing backlog of natural and physical resources makes it possible to locate easily and advantageously in this versatile State.

**Georgia** is a busy state — busy supplying a wealth of goods to every part of the world. Behind this modern-age success story lies a wealth of vast resources and rich opportunities — strategically located for expansion in many industrial endeavors. Over 7,100 new firms — including many of America's top industrial names are finding that it's good business to produce in Georgia. If you're planning to expand — if you want new, fertile fields . . . by all means — see what Georgia so abundantly offers you.

### ✓ Great, New Markets

New industries flourish in Georgia — because of the newly developed, easily accessible consumer markets in the immediate area. Everything from Automobiles to Zippers is being produced profitably in Georgia.

### ✓ Transportation

Georgia is the strategic hub of the Southeast — served by 34 railroads, over 1000 trucking lines, 118 bus lines and large airports. It is easy to move goods in Georgia.

### ✓ Great Agricultural State

Ideal cultivating conditions — plus nine climatic zones contribute to Georgia's record variety and fabulous production of soil products.

**Industry is on the move to Georgia — where an appreciative spirit of welcome awaits new enterprises. We invite your inquiry on manufacturing and distributing facilities.**

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**Ga. Dept. of Commerce, 100 State Capitol**
**Atlanta, Georgia**

Dept. D-2

Please send your latest facts and figures on Georgia's Industrial advantages to personal attention of:

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3. **The waste of idle trucks**
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With this service, you can *forget all about your trucking problems!* You furnish your own driver—and that's all! Hertz does the rest.

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**2.** Hertz will buy your present trucks at mutually agreed prices, and keep them in service; or, if worn out, will replace them with new Fords or other fine trucks.

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**4.** Trucks engineered to your needs—Hertz supplies the exactly right trucks for your precise needs, whether you need one truck or one hundred. Our truck engineers are at your service.

**5.** All gasoline, oil, etc., supplied by Hertz—You furnish one thing only—a driver. Hertz takes care of everything else.

**6.** Insurance protection provided to suit your needs. If you prefer, we will place the policies through your own broker or agent.

**7.** Extra trucks when you need them. In case of peak periods or rush loads, Hertz supplies extra trucks.

**8.** Easier bookkeeping for you. Instead of many bookkeeping items you have only the one bill sent by Hertz. It saves you the time and expense of keeping reports and cost sheets of numerous items for servicing, gasoline and oil, repairs, etc.

**9.** Good-looking equipment adds prestige to your company. Your trucks always look attractive. Never dirty or run-down. It's good advertising.

### Get a FREE analysis of your trucking operations

Simply call your nearest Hertz office. You will find it listed under "H" in your telephone directory. Our representative, an expert trucking engineer, will make a free analysis of your problems and needs.

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HERTZ TRUCK RENTAL SYSTEM ®

## HERTZ *Truck Rental* SYSTEM

Need a car? Hertz has them, too! Low rate includes gasoline, oil and proper insurance. *Call your local Hertz office.*

**NEW METHODS AND MATERIALS**

# *Better tools for design, production, assembly, testing*

ALSO { *How to improve old products* / *The all-aluminum plant*

## *Epoxies: New resins add zip to production*

A new family of resins is paving the way for better production methods, more efficient maintenance, and a host of new products from adhesives to printed circuits.

Their name: Ethoxyline or epoxide resins, *epoxies* for short.

Their advantages: hardness and heat resistance, plus valuable chemical and electrical properties and compatibility with other resins.

The epoxies are unusually friendly materials. They can be combined with polysulfide rubbers, furane resins, phenolics, polyamides, polyesters, melamines, urea, styrene, and vinyls to produce adhesives, coatings, tooling compounds, and the like. In each case, the combination offers real advantages for many products over either of the materials used alone.

Epoxy-polysulfide combinations are flexible materials that are said to exhibit good electrical properties and chemical resistance, low shrinkage, resistance to weathering and aging, and good impact strength.

Polyamide-epoxy blends can be made to range all the way from soft and flexible to hard and rigid—offering good adhesion, high dielectric strength, and resistance to water and chemicals throughout the range.

Phenolic-epoxy compounds take advantage of the low cost and heat resistance of the former while gaining the adhesive strength and excellent curing properties of the latter.

Small wonder that new epoxy-based materials are appearing like rabbits.

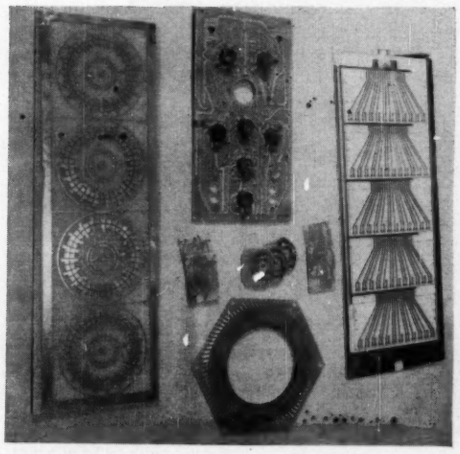
More than a score of companies now produce epoxy-based adhesives, resins, and coatings, using materials supplied by such companies as Bakelite, Borden's, Ciba, Devoe & Raynolds, Dow Chemical, General Electric, General Mills, Monsanto, Reichhold Chemicals, Rohm & Haas, and Shell Chemical. Particularly promising are epoxy-based linings for metal and paper containers and epoxy adhesives for bonding metals to glass and other non-porous materials.

Minnesota Mining & Manufacturing Company uses epoxies in its new *Scotchcast* electrical splicing and embedment resins (see December 1954, page 41) and its ready-to-use *Scotchply* reinforced plastic sheet (see January, page 62).

There is a good deal of interest in epoxy tooling compounds. Their low shrinkage, high impact strength, and good adhesion to the glass-fiber materials used for reinforcement make it possible to turn out jigs and fixtures (see photographs, page 82) and even drawing and blanking dies for sheet metal.

Epoxies are still very young and many of their possibilities remain to be explored.

For instance, Shell Chemical notes that foamed resins can be produced—perhaps for use (like



**Printed circuit bases** take advantage of Epon resin's stability, high dielectric strength. Etched copper cladding serves as current-carrier.

**Epoxy resin castings** are easy to make when flexible vinyl molds are used. Here, mold is filled with a cold-setting, self-curing epoxy resin.

**Gears, cams,** and other intricate parts pop out of flexible molds with ease. Houghton Laboratories developed technique, uses Bakelite resins.

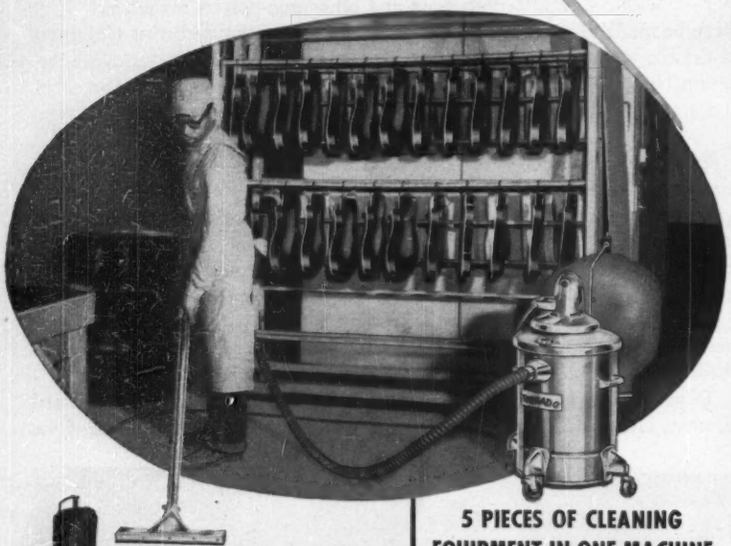
TORNADO
hits a high note
in shop cleaning at
VALCO

*Valco Manufacturing Co., Chicago, Illinois, is one of the largest manufacturers of precision built electronic guitars and amplifiers.*

In the manufacturing of fine musical instruments at Valco, Tornado plays an important part in keeping shop areas clean and dust-free.

From the woodworking shop to the painting and finishing rooms, Tornado's 325 M.P.H. suction speeds up every cleaning operation.

Find out how faster, easier Tornado cleaning can reduce your cleaning costs—actually improve production. Write for literature (Bulletin 660) and an "in-your-plant" demonstration.



NEW TORNADO JUMBO CONVERSION KIT

With this kit the motor unit from a Tornado vacuum cleaner converts any standard 55 gallon drum into a Jumbo Vacuum Cleaner.

5 PIECES OF CLEANING EQUIPMENT IN ONE MACHINE

- Standard Tank Type Cleaner
- 55 Gallon Cleaner
- Portable Electric Blower
- Air Sweeper
- Insecticide Sprayer

BREUER ELECTRIC MFG. CO.

5106 NORTH RAVENSWOOD AVENUE • CHICAGO 40, ILLINOIS

TAKES THE DUST IN INDUSTRY OUT OF INDUSTRY

other expanded plastics; see November 1953, page 54) for insulation and flotation, and as stiffening elements in sandwich materials.

Wherever there's need for a material that can be cast or laminated to form hard, durable structural parts and components; a tough, long-lasting coating; a better adhesive; or a new impregnating material for paper, wood, or textiles, epoxies rate a close look—they can add new zip to products as well as production methods.

### *Never too old to learn*

Think your product is so old, so well established, or already so varied that little more can be done with it? Then take a look at these:

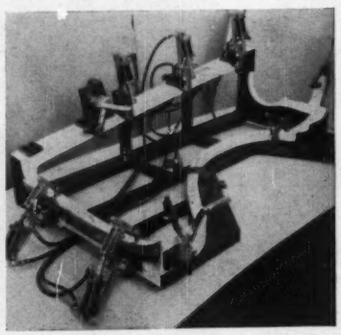
- The lead pencil hasn't changed in almost two centuries. It certainly looked like an established product. Yet Parker Pen Company found a way to combine the writing ease and erasability of a pencil with the durability of a ball point pen, and seems destined to start a real revolution in writing implements. Its *Liquid Lead* pencil writes and erases like an ordinary one, but the point won't break and never needs sharpening, and the line it writes won't smudge.

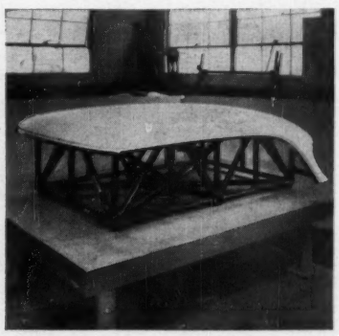
According to Parker, several previous attempts to combine a ball point with an erasable ink failed because the pigment used simply did not do an adequate writing job. Parker's is a real graphite pencil and can, according to the company, be made in all the writing types now offered in wood and mechanical pencils.

- Measuring tapes have been a standard product of Lufkin Rule Company, Saginaw, Mich., since the turn of the century at least. Yet, within the past year, Lufkin has come up with a swarm of new ideas. Among them: a nylon tape that resists rot and stretching (see July 1954, page 66); two new coatings for metal tapes that make them easier to read (a white finish and a long-lasting chrome finish); a magnesium housing and a polystyrene display and carrying case for the White-Clad Mezurall line; and a ¾-inch tape, wide enough to permit marking in feet and inches on one side and consecutive inches on the other.
- Ovens for kitchen stoves haven't changed much in a long time, either. But Kelvinator Division, American Motors Corporation, with the help of Reynolds Metals Company, managed to come up with a brand-new idea for 1955: disposable walls. The broiler section of the oven is fitted with removable wire racks that are covered by cut-to-size aluminum foil sheets. The sheets are inexpensive and replaceable in a minute when they become grease-encrusted. Result: time-saving for the housewife, a sales plus for Kelvinator, and a new market for the foil-supplier.
- As still another example, the variety of fastening devices made by Tinnerman Products, Inc., Cleveland 1, Ohio, is already tremendous. Yet the company continues to open new markets by keeping up with technical developments in other fields. Just recently, for instance, Tinnerman introduced a speed clip for shell molds (see September 1954, page 40) and several new clip-connectors for use with printed electrical circuits (see March 1954, page 48).

How about a new look at your own product?

*Continued on page 84*





**Dimensional stability** and speed of fabrication recommend epoxy plastics for welding fixtures and Keller machine master models like those shown here. Ren-ite supplies tooling compounds, based on Bakelite C-8 resins.

SPOTLIGHT

ON SUPERIORITY

*Portrait of Claes Duyst Van Voorhout by Frans Hals in the Jules S. Bache collection—New York Metropolitan Museum of Art.*

Rising

*Ask your printer or paper merchant to show you the Rising catalog containing a superior paper for everything from a wedding announcement to a stock certificate. Qualities up to 100% Rag.*

RISING PAPER COMPANY...IN THE BERKSHIRES, HOUSATONIC, MASS.

**WATER AND POWER**

In this western area there's an adequate supply of water and electric power, so essential to industry.

**LOW UTILITY RATES**

help to keep down costs in any industrial or commercial project.

**AGRICULTURAL PRODUCTS**

Firms that process or pack basic agricultural commodities will find a wealth of farm produce conveniently near in the "U. P. West."

**MINING PRODUCTS**

Ore and minerals found throughout the West are important to many concerns seeking an industrial site.

**FOREST PRODUCTS**

The Pacific Coast states, particularly, provide more than sufficient lumber for building material and wood product manufacturers.

**LABOR SUPPLY**

It's a distinct advantage to be able to find local, reliable workers who are "rooted" in this western country.

**GOOD LIVING CONDITIONS**

The "wide open spaces" are ideal for healthful living and a happy home life; a factor to consider in management-employee relationship.

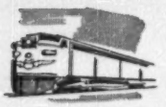
**RECREATIONAL OPPORTUNITIES**

From the top down, all employees can enjoy a fuller life where there are places close by for fishing, hunting and other outdoor recreation.

*and* **TRANSPORTATION**

*Union Pacific provides the finest of rail service. In many cases, industry trackage can be built where requested.*

* * *

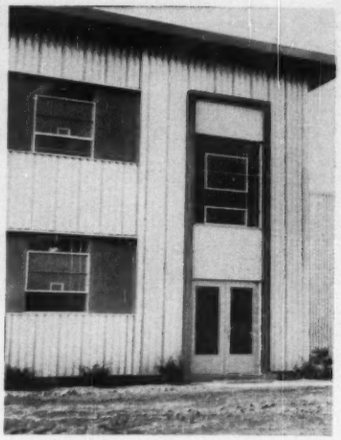


If interested in an industrial or commercial business site within the area served by U. P., write Industrial Properties Department, Room 354, Union Pacific Railroad, Omaha 2, Nebraska, for confidential information—or contact your local U. P. freight representative.

**UNION PACIFIC RAILROAD**
**OMAHA 2, NEBR.**

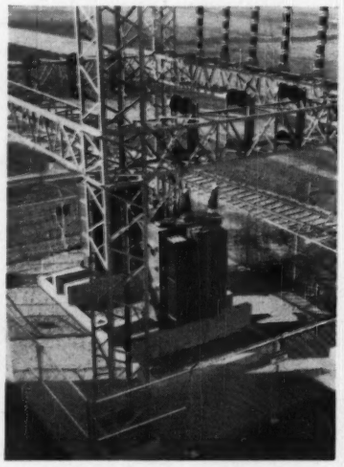


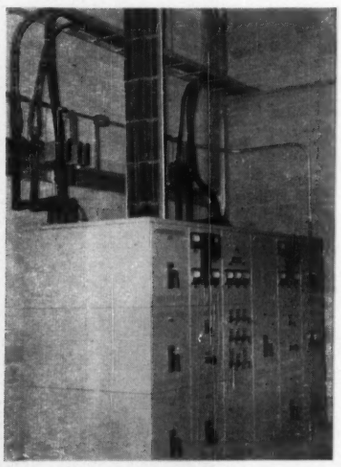
## *Aluminum can do it, too*



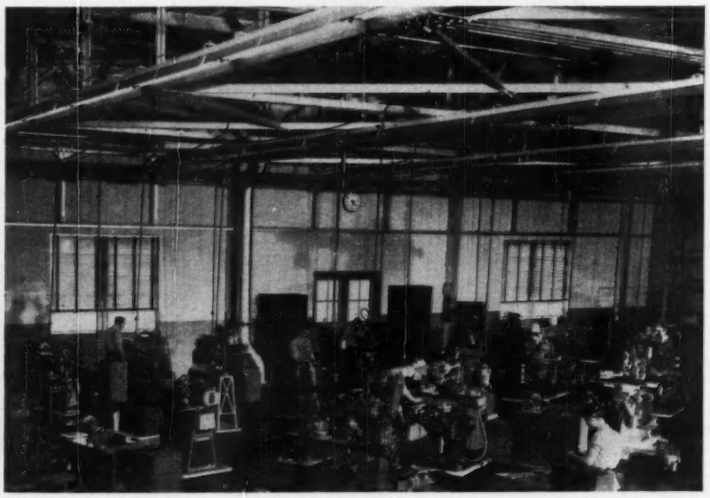
**Aluminum panels** are exterior facing of new Alcoa Lancaster plant.

That's Alcoa's claim—and the company has built an almost all-aluminum plant to prove it. The plant is the new Alcoa Lancaster Works, for producing fasteners and other cold-headed and screw machine products. Aluminum plays a major role outside as well as inside the plant. The electrical substation (left, below) is built of aluminum, surrounded by an aluminum fence, and fed by aluminum cable. Other plants might not want to use the metal quite as extensively—but this is the Aluminum Company of America's way of proving that it can be done.





**Electrical current** is carried from all-aluminum substation (left) to main switch panel (right), and through plant by aluminum cable and bus duct.



**Aluminum conduit,** bus duct, cable, and lighting reflectors are used in Lancaster machine shop. Ventilating system ductwork is aluminum, too.

# THE NATIONAL CITY BANK
## OF NEW YORK

*Head Office* • 55 WALL STREET • *New York*

71 Branches in Greater New York  57 Branches Overseas

*Statement of Condition as of December 31, 1954*

### ASSETS

| | | |
|---|---|---|
| Cash, Gold and Due from Banks | | $1,311,011,894 |
| United States Government Obligations | | 1,842,996,802 |
| Obligations of Other Federal Agencies | | 35,464,846 |
| State and Municipal Securities | | 596,283,109 |
| Other Securities | | 60,581,083 |
| Loans and Discounts | | 2,337,065,556 |
| Real Estate Loans and Securities | | 4,978,328 |
| Customers' Liability for Acceptances | | 43,819,480 |
| Stock in Federal Reserve Bank | | 15,000,000 |
| Ownership of International Banking Corporation | | 7,000,000 |
| Bank Premises | | 27,177,771 |
| Items in Transit with Branches | | 38,100,729 |
| Other Assets | | 3,625,188 |
| *Total* | | $6,323,104,786 |

### LIABILITIES

| | | |
|---|---|---|
| Deposits | | $5,639,188,380 |
| Liability on Acceptances and Bills | $75,693,233 | |
| Less: Own Acceptances in Portfolio | 29,344,669 | 46,348,564 |
| Due to Foreign Central Banks (*In Foreign Currencies*) | | 18,492,300 |
| Reserves for: | | |
| Unearned Discount and Other Unearned Income | | 22,472,680 |
| Interest, Taxes, Other Accrued Expenses, etc. | | 38,440,249 |
| Dividend | | 5,500,000 |
| Capital (*10,000,000 Shares—$20 Par*) | $200,000,000 | |
| Surplus | 300,000,000 | |
| Undivided Profits | 52,662,613 | 552,662,613 |
| *Total* | | $6,323,104,786 |

Figures of Overseas Branches are as of December 23.

$400,361,995 of United States Government Obligations and $19,082,200 of other assets are pledged to secure Public and Trust Deposits and for other purposes required or permitted by law.

(*Member Federal Deposit Insurance Corporation*)

Affiliate of The National City Bank of New York for separate administration of trust functions

**CITY BANK FARMERS TRUST COMPANY**

*Head Office:* 22 William Street, New York

*Capital Funds* $32,037,611

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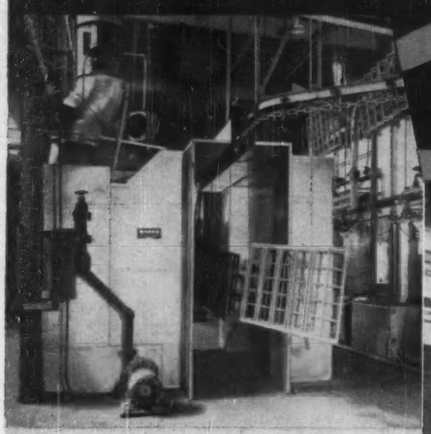
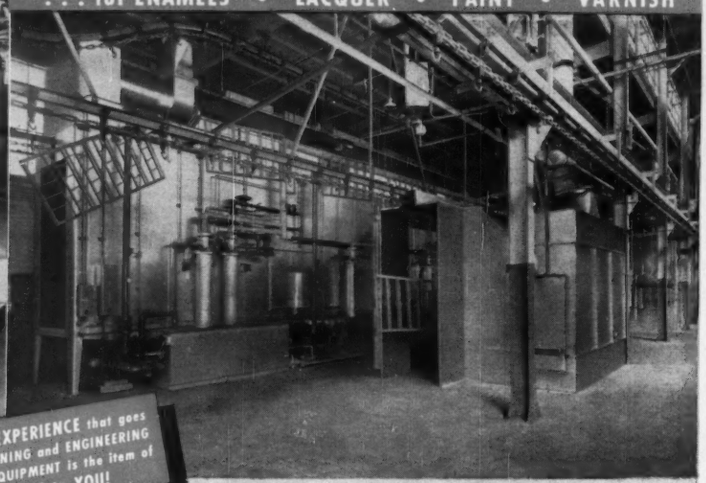
. . . for ENAMELS • LACQUER • PAINT • VARNISH

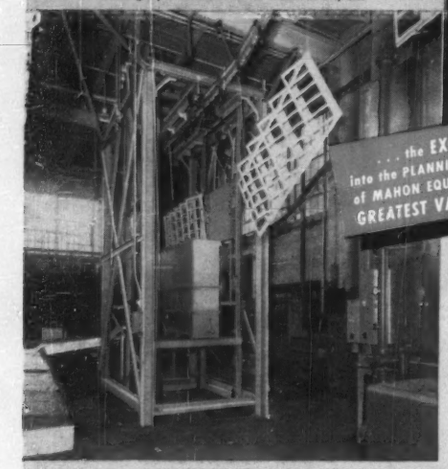


Mahon Hydro-Filter Spray Booth—part of the Complete Mahon Finishing System installed for Color-Craft, Inc.

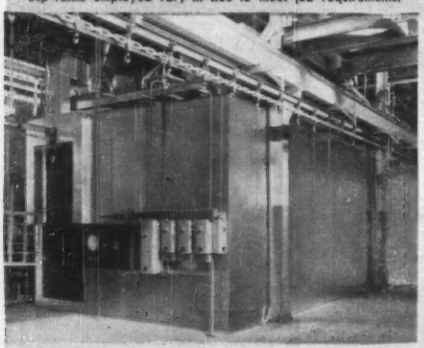


General view of the Complete Mahon Finishing System at Color-Craft, Inc. Facilities include Six-Stage Metal Cleaning and Rust Proofing Equipment.

. . . the EXPERIENCE that goes into the PLANNING and ENGINEERING of MAHON EQUIPMENT is the item of GREATEST VALUE to YOU!



Mahon Automatic Dip-Coating Machine at Color-Craft, Inc. Dip tanks employed vary in size to meet job requirements.



Mahon Finish Baking Oven—part of the Complete Mahon Finishing System installed for Color-Craft, Inc., Detroit, Mich.

## *COLOR-CRAFT, Inc. Chooses MAHON EQUIPMENT for High-Quality CONTRACT PAINTING OPERATIONS!*

When the Color-Craft organization in Detroit decided to go into the contract painting business, the two most convincing points in selling this painting service to manufacturers were Color-Craft's know-how, backed by over twenty-five years of experience, and new, modern processing and coating equipment and other facilities capable of producing at minimum cost the fine finishes demanded in today's highly competitive market. Color-Craft turned to Mahon for the type of equipment deemed necessary for a successful and profitable operation. Mahon planned, engineered, built and installed a complete finishing system flexible in its cleaning and pre-paint processing of metals and capable of handling the wide variety of shapes and sizes in parts and products encountered in this type of finishing operation. The choice of Mahon Equipment was not only a wise decision, but a logical one in this case, because more automobiles and more home appliances are finished in Complete Mahon Finishing Systems than all other types combined—an indisputable tribute to Mahon's performance in this highly specialized field. If you are contemplating new finishing equipment, you, like thousands of other quality-minded manufacturers, will find that Mahon engineers are better qualified to advise you on both methods and equipment requirements . . . and better qualified to do the all-important planning, coordinating and engineering of equipment—which is the key to fine finishes at minimum cost. You will find also, that Mahon equipment is built better for more economical operation over a longer period of time. Mahon will furnish your complete system on one contract . . . undivided responsibility for the entire job safeguards you against complications which may upset your production plans and subsequent schedules. See Sweet's Plant Engineering File for information, or write for Mahon Catalog A-655.

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# MAHON

## SMALLER PLANTS SHARE THE HEALTH

*Continued from page 46*

Health Services. When Champion Paper Company decided to give periodic examinations to its 4,000 employees in Hamilton, Ohio, for example, OHS's big tractor unit brought in its two huge, specially designed, aluminum trailers, and parked behind the plant.

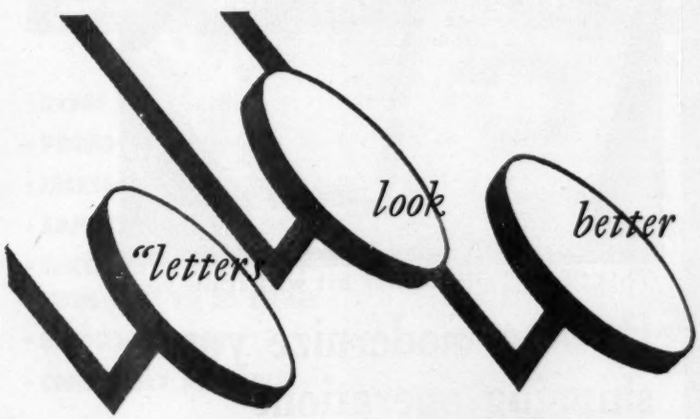
Air-conditioned throughout, the trailers are joined at two places with trainlike vestibules, and the interior layout is such that employees pass through a series of examination rooms as fully equipped as a downtown clinic. Down the length of one trailer, across into the next, and back up to the same door where they entered, they proceed at the rate of 45 to 60 a shift.

An auxiliary house-trailer has been equipped with a complete clinical laboratory; here analyses and tests are run on samples of blood, urine, and so on, as quickly as the employee passes through the clinic. A good business man as well as a doctor, Robertson rents out his big tractor unit to nearby contractors while the clinic trailers are parked at the plant for two to twelve weeks.

Technicians, nurses, receptionists were furnished by the Asheville group for the Hamilton, Ohio, physical check-ups and for a similar but smaller undertaking in Mattoon, Ill. But local doctors conducted the examinations in each case. In Hamilton, Dr. Robertson's group worked with the plant medical director; in Mattoon, with the Link Clinic, a local group that performs the regular, around-the-year industrial doctoring for a number of that city's plants.

Employees' blood is tested for red cell and white cell count, for blood sugar, venereal diseases, hidden jaundices; a urinalysis is made and an electrocardiogram; visual and audiometric tests are given, and the chest is X-rayed; the complete physical examination includes pelvic and rectal examination, and for women, cancer smears are taken.

Normal procedure is for the medical director to keep all individual reports, turning over summaries to the company, and refer-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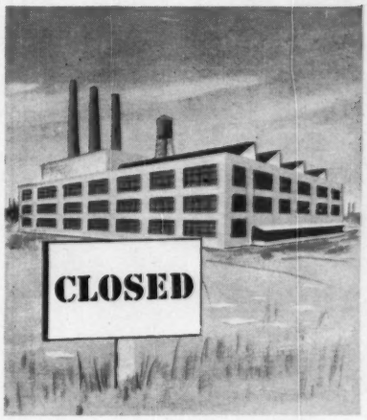

## the difference between Profits and Losses

In so many cases the difference between profits or losses is adequate operating cash. Lack of operating funds forces companies to take the expensive route in doing business:

*Passing up trade discounts*

*Buying uneconomically*

*Losing sales because sufficient credit cannot be extended to the trade*

*Using high-cost, old machinery or equipment*

*Carrying incomplete inventories*

*Charging a premium for their product to compensate for higher internal costs*

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McCloskey buildings are easily and economically erected using local facilities or through the McCloskey organization. RIGID FRAME design permits easy accessibility for cleaning and painting, resulting in substantial savings in maintenance cost.

Buildings engineered by the McCloskey Company of Pittsburgh—whether large or small—are planned and built to *suit your purpose.*

As functional housing for industries, *they can include* provision in the basic structure for monorails, craneways, overhead conveyors, variated levels, etc.

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*YOUR INQUIRY places you under no obligation.*

McCLOSKEY COMPANY OF PITTSBURGH

designers and builders

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ring those who need medical care to their family physicians.

Records of the examinations are taken in a form that permits easy transferral to IBM cards. One result of this kind of record is that Dr. Robertson is building up a statistical file which will, eventually, show the incidence of various ailments in different jobs and industries, broken down by sex, age, or any other of many categories. While not of immediate use to the employer, this material, it is expected, will furnish data for further research in industrial health.

The Asheville doctor manages to supervise widely scattered operations by use of a private plane, which gets him to or from his home base in a few hours, regardless of where the trailers are set up.

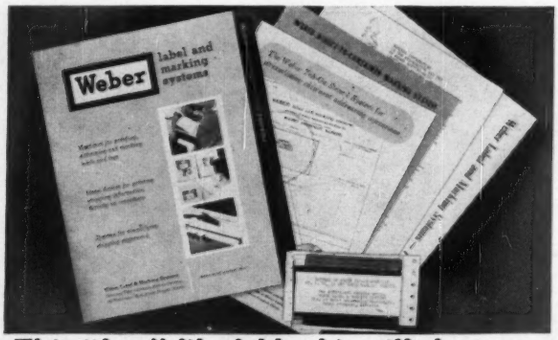
To date Dr. Robertson and his associates have not undertaken any plant programs outside their home area where the complete service was used—environmental control, placement and direction of nurses, health education for employees, and the like. They calculate that there must be about 2,000 employees using the service within a commuting area to warrant a full-time doctor.

Their concept of commuting area is broad, however. In one situation, still in the negotiating stage, the local doctor in charge would cover installations over a large part of one state by using a small plane for intercity hops.

Still another phase of the Asheville group's program, a special executives' health program, involves a three- to five-day visit to the Southern resort town while the various examinations are made.

A good example of the local industrial health clinic that has sprung up as a result of the enterprise of local physicians and surgeons is the Link Clinic, with which OHS cooperated in Mattoon.

Dr. Edward N. Zinschlag of Link Clinic, for instance, spends an hour a day in the plant in which the periodic examinations were made under Robertson's guidance. He reviews minor injuries of the past 24 hours, is available for consultation with supervisory personnel regarding medical and safety problems, and for advice to indi-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vidual employees.

Doctors from the Link Clinic conducted the actual examinations when the OHS came in. Nearly 98 per cent of the plant's employees participated in the program, which was voluntary. All women employees were tested for cancer, and one early-stage case was detected in time to arrest it.

"It improved the morale of the employees," Dr. Zinschlag reported, "made them health conscious, and brought to light many minor deviations from normal which needed correction, as well as a few major ones. The individuals having these deviations from normal were most grateful to learn—in time for remedy—they had them and immediately instituted corrective measures" —through personal physicians.

A number of clinics operated by doctors exist in industrial communities, but most of them are devoted to workmen's compensation cases. The National Industrial Conference Board, in a report on cooperative medical programs in 1953, quoted one informant as saying of this type of clinic: "Some are purely curative facilities and do not represent a real health program or preventive medical program."

Very much like Dr. Robertson's and the OHS's service, except that it is stationed in one city instead of being a mobile outfit, is The Northwest Industrial Clinic, 3101 University Ave., S.E., Minneapolis 14, Minn.

Dr. Leonard Arling, director of the clinic and one of its founders, describes in detail how it was established in a report in the medical journal, *Occupational Medicine,* issue of March 1947, Vol. 3, entitled "Recent Experiments in Medical Service for Small Plants."

The article is well worth showing to any local doctor interested in the possibilities of industrial medicine: it tells how this Minneapolis establishment was set up, how it maintained its independence of companies (so that employees never had the common fear of the "company doctor"), and how it grew from providing preplacement examinations for a few plants to conducting comprehensive industrial medical programs for a great many.


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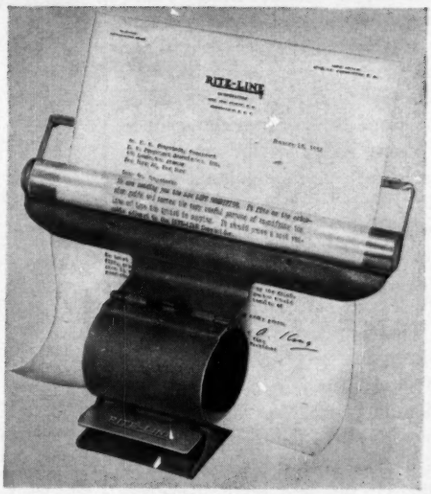


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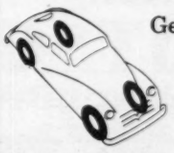

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Heretofore, it was impracticable to use punch cards in many instances because of the cost and bother resulting from damaged cards. Rumpled edges, creases, staples, paper clips, cellophane tape—all caused no end of trouble, jammed sorting machines, required costly, time-wasting hand sorting.

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The services rendered by the Northwest Clinic are essentially the same as those in Dr. Robertson's comprehensive program. Also, the clinic has arrangements with three psychiatrists for reference of workers with behavior problems.

The story of this clinic would make a good case study for the researcher looking for an example of the success of "free enterprise" in the professional field. Says Dr. Arling: "The physician who invests his own capital and effort in developing a broad industrial medical service will take a 'private practise' interest in every employee from the lowest paid hourly worker to the top management or owner."

Another industrial medical undertaking, which differs radically from those mentioned, is the "Birmingham Plan," organized as the result of joint interest of the Public Health Committee of the Birmingham, Ala., Chamber of Commerce and the Public Health Department of that city, under direction of the health officer, Dr. George A. Denison.

Launched as the Industrial Health Council of Birmingham with a membership of nine concerns employing about 1,500 persons, it now has about 240 member concerns with some 35,000 employees. Started solely to conduct health education among Birmingham workers, it was screening for syphilis and tuberculosis before the end of its first year, and has been expanding the scope of its services ever since.

Surest sign that the small-plant medical program is gaining serious attention not only of progressive individual companies and doctors, but also of industrial management and the medical profession as a whole, comes from Wisconsin.

There, discussions are under way within and between the Wisconsin Medical Society and the Wisconsin Manufacturers Association looking towards a model program being made available to any plant anywhere in the state. Medical societies in Wisconsin have already for some time been giving advice to small plant owners.

The four plans described above and the prospective Wisconsin program are only a few among many variants now available as guides. 1955 looks like an active year in the industrial health movement.

THE END


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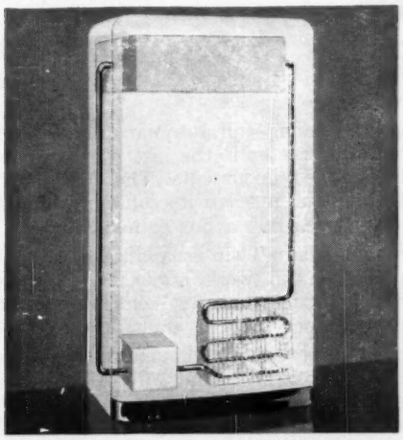

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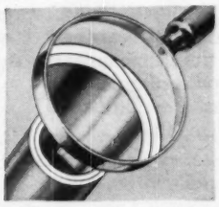

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# CONSTRUCTION TO BREAK RECORD FOR 10TH YEAR

*Residential building will be mainstay but public construction is coming up fast.*

The fabulous construction industry is shaping up as a major market again in 1955. Despite dire predictions almost annually since 1949, construction volume has continued to expand. Last year it broke its ninth successive record and the outlook is for another record-breaking year in 1955. In the year just past, about one dollar out of every seven spent for goods and services was spent for construction or, if you prefer, nearly 15 per cent of Gross National Product was construction.

This year, according to the Associated General Contractors of America, construction volume may reach $56 billion in the continental United States, plus an extra billion of federal construction offshore. About 17 per cent of all full-time employees are directly or indirectly hired by the construction industry.

The market will be paced this year by private construction, with the total reaching as high as $27.75

*Booming public building will fill up gap left by declining industrial building*

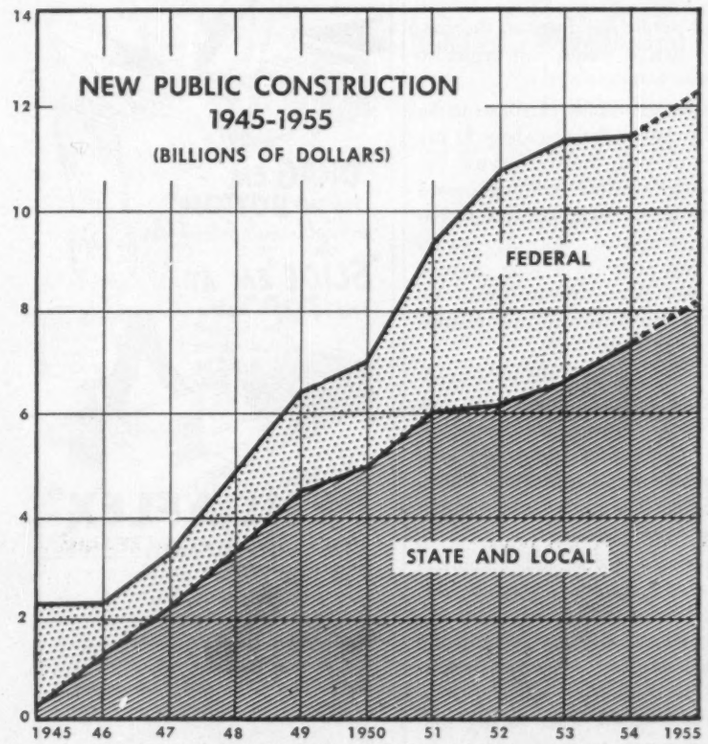


*Chart and 1955 projection by Associated General Contractors.*

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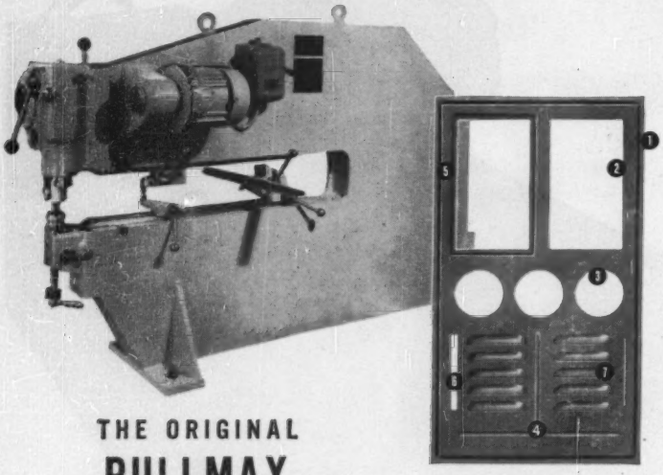

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billion. The AGC thinks that residential construction will dominate the private market with more than 1.3 million new units for a total of $15 billion.

Commercial spending on construction is slated to rise to $2.5 billion, stimulated by increasing investment in suburban developments. Industrial building is slowing down somewhat as the Government's quickie tax amortization loses its appeal, but the total here may approach 1954's $2 billion worth of new plants.

Public utilities, despite declines in railroad and gas facilities, are expected to hold to around the $4.4 billion mark. Churches and educational facilities may reach about $1.4 billion.

### *Watch Public Building*

In the long run, one of the key props in the construction market may turn out to be in public construction. Sooner or later, most analysts expect private residential construction to slack off to a lower plateau, regardless of easier mortgage incentives. Industrial construction has already begun a mannerly retreat, following years of unprecedented expansion, and a major upward thrust in activity is not expected soon.

But public building, on the contrary, has, it seems, just begun to move.

True, total federal construction is expected to drop to about $1 billion this year, mainly because unusual or windfall building caused by atomic energy expansion has been completed. But the federal building program is long overdue and new lease-purchase legislation is expected to provide the needed shot in the arm.

The key factor in the public construction picture, however, is state and local construction. This year the AGC expects state and local governments to spend more than $8 billion. That figure may turn out to be conservative.

Increased federal-aid authorizations come into full play during this year. President Eisenhower has advocated new highway construction strenuously and it has received an unusual amount of publicity. Public construction, after falling into near-disrepute for some years, is apparently being viewed sympathet-

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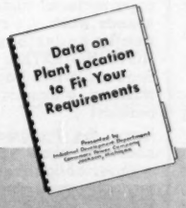


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ically by the voters again. During the last three years a record level of bond issues has been approved by the electorate. Last November more than $1 billion in construction bonds were approved and more bond issues will be voted on during this year.

### *Educating Public Pays*

The educational campaigns of the construction industry and the more recent ones by the motor carriers and the rubber industry in mass circulation magazines may be getting results. It is altogether possible, for example, that Washington estimates of $4.2 billion in new highway construction this year will be exceeded and that 1956 may see that figure alone almost doubled. One group estimates that after nearly a decade and a half of relative inactivity, it will take $15 billion more than we are currently spending to catch up on national requirements in community facilities alone. Note that this represents only a catching-up. Even more would be needed to keep abreast of current population pressures, with a population expanding at the rate of about 2.7 million annually. Not that this amount of building expansion will be achieved, but the rate of expansion appears to many observers certain to accelerate, inhibited mainly by necessary increases in local tax rates.

What this suggests, of course, is that the construction industry and their suppliers and *their* suppliers, barring unexpected contingencies, will hold for the next few years a prominence in the economy they have not known since the mid-twenties, when their portion of Gross National Product last reached the 15 per cent mark. Though total construction will be buoyed up by expanding public construction, the critical factor, it is thought, is whether the financial incentives for private residential building will continue to lure as many buyers as in 1954.

Should easier mortgage terms fail to hold new residential construction to the 1954 mark or should the mortgage money market harden, many builders count on expansion and modernization on existing homes to fill a large part of the void. The same logic is applied to declines in industrial building.


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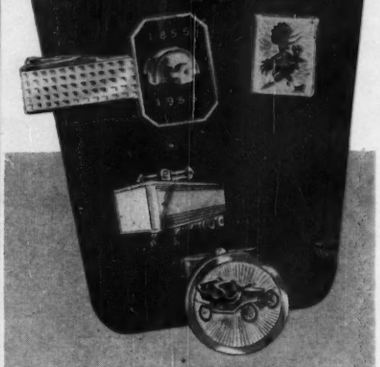

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Says one user: "We got our Ozalid Bambino around the first of February, just in time for the big rush on tax returns. And by March 15, the Bambino saved enough in extra secretarial service and clerical overtime to pay for itself. And it has saved us a lot of time in the preparation of reports ever since."

**The Ozalid copying process** saves the time and cost of transcribing, and proofreading or checking figures—and makes available quickly and cheaply any needed number of copies of tax forms and supporting schedules.

Stencils and negatives, developing and drying are unnecessary. Reproduction is chemical, instantaneous. A legible, dry copy is made in less than a minute, for less than two cents.

**You do need** translucent copies of tax forms; any Ozalid representative can supply them. Just put the filled-out translucent form over a sheet of Ozalid coated paper, feed to an Ozalid machine and your copy is printed.

Originals can be kept in your files, for making future copies. Ozalid copies are accepted by Internal Revenue, and most State Tax Departments.

Ozalid copying also makes possible a wider use of handwritten forms for the simpler returns, saves original typing.

And your Ozalid machine will save innumerable hours on cumulative and comparative statements and reports. Just add new entries on the translucent original, and make current copies.

**Every accounting office** can use the efficiency, the convenience, the savings in time and costs that Ozalid affords. Ask the nearest Ozalid distributor *(see phone book)* for a demonstration. Or write 47 Ozaway, Johnson City, N. Y.

OZALID—A Division of General Aniline & Film Corporation... *From Research to Reality*... In Canada, Hughes Owens Company, Ltd., Montreal.

# OZALID

*The BAMBINO—is the smallest, fastest, low priced office copying machine... handles sheets up to nine inches wide, any length ...makes up to 200 copies an hour, for less than 2¢ a copy.*

# American Credit Insurance
AND
# The Case of the Concentrated Risk

THIS is an example of the ability of American Credit Insurance to handle even the isolated instance of exceptional risk. It illustrates a principle which applies whether your own business is large or small.

The policyholder, a manufacturer of small electrical appliances and components already insured under a general coverage policy, was asked by another manufacturer to furnish the chief component of a well-known brand name appliance. The opportunity was unusually tempting, since demand would be continuous, the profit offered was good, and sales expense was negligible.

Nevertheless, the policyholder hesitated. Could he risk so many of his eggs in the one basket? Could he afford to tie up so much of his working capital as would be involved if the account receivable became an item past due? Previous relations between the two concerns had always been of the best. And yet . . .

The policyholder's Credit Manager recommended consultation with American Credit. After study and discussion, it was decided that increased coverage or extraordinary coverage, as riders to the existing policy, would not meet the situation. What then? A separate single risk policy was issued, granting coverage on this one account up to a total of 150 thousand dollars, with a deductible of only fifteen thousand.

Within the year, the Credit Executive's worst fears were realized. The buyer of the components was unable to move a sufficient quantity of *his* finished product, through being caught in production difficulties at a seasonal peak. The account was filed as a past-due item, aggregating more than 120 thousand dollars. The policyholder received a loss payment of somewhat more than 105 thousand dollars. Thus, most of the eggs in the basket that proved unsound were not even cracked, and the policyholder continued business without even temporary loss of working capital.

Whether your business is faced with many risks or only one concentrated risk, you will find new assurance in knowing that your accounts receivable have the same degree of insurance protection as your machinery, your buildings, and your product. For your copy of a new booklet: "*Credit Insurance, Its History and Functions*," write Department 50, First National Bank Building, Baltimore 2, Md.

**American Credit Indemnity Company**
of New York


# *Here and There in Business*

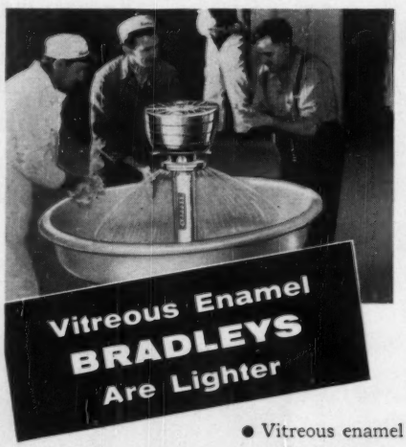
## WHAT'S NEW
## AS OBSERVED BY THE EDITORS

***Electronic computers*** are now making steady gains in both private business and Government operations and their usefulness increases as new jobs are found and new types enter the lists.

For general industrial use there is a new, small-sized computer, consisting of two units (calculation and translation), introduced by Victor Adding Machine Company, Chicago, Ill. Named Vic-Dar (picture on page 99 top), it is designed for data accumulation and reduction, will test and translate variables —heat, speed, and the like.

The "Mobilac," a high speed digital computer, manufactured by ElectroData Corporation, Pasadena, Cal., is soon to be in operation at Socony-Vacuum's Research and Development Laboratory, Paulsboro, N. J. Mobilac, pictured page 99 center, will be used to determine optimum valve-settings and other operating data.

Life insurance companies are also finding the "giant brains" can save hundreds of man-hours in the computations necessary for efficient business. John Hancock Mutual Life Insurance Company is now


Easily kept spotlessly clean.

Made in full-circle and semi-circle (wall-type) models finished in white or forest green acid-resisting vitreous enamel.

● Vitreous enamel Bradley Washfountains are selected often because they are lighter than precast stone or marble models, the bowl being a one-piece pressing of deep-drawing steel. They have all other Bradley features — central sprayhead, foot-control, low installation and maintenance cost. For full details, write for Catalog 5204.

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**BRADLEY** *washfountains*

*Distributed Through Plumbing Wholesalers*

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**NEW SHREDMASTER**

## Bantam 10

**portable shredding machine designed especially for office use! Quiet, compact, streamlined!**

Never before an office shredding machine combining the speed and economy of the new SHREDMASTER BANTAM 10. Anyone can operate it. No fuss, no trouble! Greater cutting width, speed, capacity, and power than ever before! Safety throat! Smart functional design, about size and weight of business typewriter.

Priced well within the budget of all businesses - large or small.

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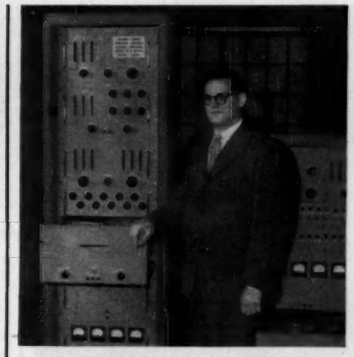
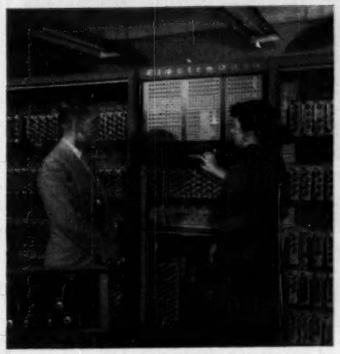
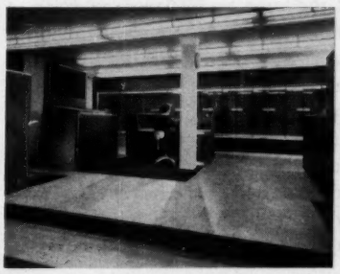




using an International Business Machines Corporation Type 650 calculator in their Boston office, and plan to install 400 of them in its offices in the next few years. Jobs selected so far include commission calculations, mortgage tables, monthly cash values and dividends, and policy valuation distributions.

New research computers are coming along, too—and growing in capability. IBM recently unveiled NORC (for Naval Ordnance Research Calculator), their largest capacity electronic calculator. Size of NORC may be judged from picture below which shows only a part of



the complete unit built to help the Navy make long-range meteorological surveys and forecasts and solve other statistical and logistic problems.

But progress does not end with faster and larger units. New components are being developed to make computers easier to use. For instance, IBM has a method for

MILCOR

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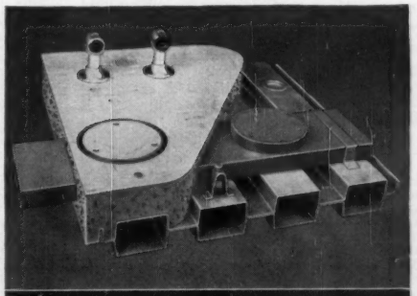
*New... the floor of the future!*

**MILCOR*** **CELLUFLOR**

**with WALKER ELECTRIFICATION**



*The cellular construction of Milcor Celluflor combines with Walker Header Ducts to provide in-floor raceways for carrying telephone, light, and signal service wires and cables. Outlets can be installed at practically any point on the floor.*

*Two-and-one-half inches of concrete fill is placed over Milcor Celluflor and contributes to its fire-resistive rating.*

**Lets you prepare today for tomorrow's circuit requirements — save money on construction, as well**

You can add as many desks, telephones, or business machines as you like — even revamp an entire floor — at any time — if your building has a Milcor Celluflor with Walker Electrification. Electrical outlets can be relocated and new ones added quickly—without the cost of extensive alterations.

Milcor Celluflor panels speed and simplify construction of your building. They provide a safe working floor, so that several trades can work at the same time. Moreover, the floor is light in weight and reduces the cost of the foundation and structural steel. Wood forms, safety staging, or temporary shoring are unnecessary.

Ask your architect or general contractor about Milcor Celluflor with Walker Electrification.

*Bulletins available upon request.*

*Reg. U. S. Pat. Off.

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M-144

BANKING SINCE 1854

# Statement of Condition

DECEMBER 31, 1954

*Resources*

| | |
|---|---|
| Cash on Hand and in Banks | $ 237,203,327.88 |
| U. S. Government Obligations | 445,729,678.32 |
| State, County, and Municipal Bonds | 63,937,188.41 |
| Other Bonds and Securities | 32,166,249.51 |
| Stock in Federal Reserve Bank | 1,758,000.00 |
| Loans and Discounts | 636,150,612.95 |
| Bank Premises and Equipment | 11,995,015.68 |
| Other Real Estate | 1.00 |
| Customers' Liability under Acceptances | 3,538,835.64 |
| Accrued Interest Receivable and Other Assets | 8,291,339.21 |
| Total Resources | $1,440,770,248.60 |

*Liabilities*

| | |
|---|---|
| Deposits | $1,337,122,966.07 |
| Acceptances Outstanding | 3,538,835.64 |
| Reserve for Unearned Discount | 9,071,676.63 |
| Reserve for Interest, Taxes, etc. | 11,988,673.01 |
| Other Liabilities | 2,493,196.44 |
| Capital Funds: | |
| Capital Stock | 22,250,000.00 |
| Surplus | 37,400,000.00 |
| Undivided Profits | 16,904,900.81 |
| Total Liabilities | $1,440,770,248.60 |

*U. S. Government and other securities carried at $151,935,405.33 are pledged to secure U. S. Government Deposits, other public funds, trust deposits, and for other purposes as required or permitted by law.*

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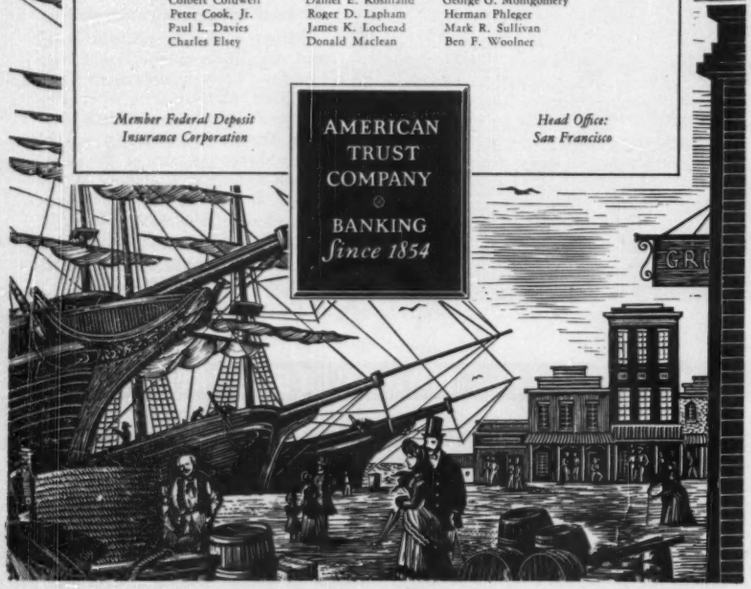
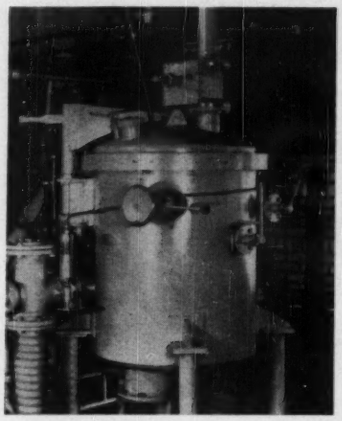



BANKING OFFICES THROUGHOUT NORTHERN CALIFORNIA

hooking up a cathode ray tube to the inner workings of a computer so that, as information is computed it is translated into light points and flashed on a television-like screen forming graphs, geometrical figures, words, numbers, and so forth. Since the visual display is continuously changing, cameras must be used to catch the images.



***A vacuum furnace*** (above) using induction heating is being offered by Naresco Equipment Corporation, 160 Charlemont Street, Newton Highlands 61, Mass. Available with vertical or horizontal shell, the 30-pound unit can maintain the vacuum while charge or alloying material is added during melting.

***Wet-strength paper*** may solve an old, troublesome, and long-neglected problem. The City of Hartford (Conn.) is trying wet-strength paper bags as garbage can liners, hopes to simplify garbage disposal and reduce noise and safety hazards at the same time. American Cyanamid Company, which produces paper-treatment chemicals, says that because the bags retain their strength even when wet they can simply be lifted out and deposited in the pickup truck, making it unnecessary to lift the heavy can, and greatly reducing the danger of dusting and spillage.

***Is your product hidden*** long before it reaches the consumer? Then take a tip from Detrex Corporation, manufacturer of cleaning compounds, coatings, and primers. Detrex has designed an attractive three-color label, and a dispenser to go with it, and is offering them to users of its Paintbond phosphate coatings for application to finished

**No. 1** in 50,000 Firms

Because It Outlasts Ordinary Brushes 3 TO 1

*27 Speed Sweep styles and sizes to meet every sweeping need. Write for prices today.*

MILWAUKEE DUSTLESS BRUSH CO.
*530 N. 22nd St., Milwaukee 3, Wis.*

REVOLVATOR
RED-GIANT
features
Safety-Ease

Durability — built in by 50 years of Revolvator Co. experience—is still the fundamental of the Red Giant liftruck line. Maneuverability, plus the safety of their exclusive double stroke mechanism, make the models shown leaders in their fields. There is a Red Giant liftruck available for every use—for every capacity.

*Write for the full facts today.*

REVOLVATOR CO.
8702 Tonnele Ave. North Bergen, N. J.

products. The labels are pre-cut and provided with a pressure-sensitive adhesive, and are furnished in roll form, attached to a paper strip backing which is stripped off by the dispenser as labels are used.

***New line of milling machines*** that does practically everything but talk was introduced by Cincinnati Milling Machine Company to commemorate its 70th anniversary. Known as the HyPowermatic line, they're equipped with automatic two-way table feed cycles and are designed for continuous operation of medium and large-sized parts. Spindle speeds range up to 2,000 rpm, and cutting capacity to 50 hp. Both plain and duplex styles are available. Lubrication is automatic, and the machines have "chip wipers" attached to the underside of the table to push chips into the large chip compartments located at each end of the bed.

***New solids pump,*** based on a new design principle is offered by Wemco Division, Western Machinery Company, 760 Folsom Street, San Francisco 7, Cal. Basically, it operates much like a fluid-type

torque converter, transmitting power to a fluid pulp and creating a vortex effect that develops the necessary suction and pressure.

As the cutaway model above shows, the new "Torque-Flow" pump features an open housing, with no small passages to clog or jam. Furthermore, the impeller is recessed so it is out of the flow path. What will the Torque-Flow pump handle? "Anything from goldfish to concrete," says Wemco. It can pump fresh fruit or crushed ore pulp—and won't even clog on large chunks, Wemco claims.

***Britain in brief.*** Convenient, pocket-sized guidebook covers everything from *Atomic Energy* (Britain is the largest exporter of

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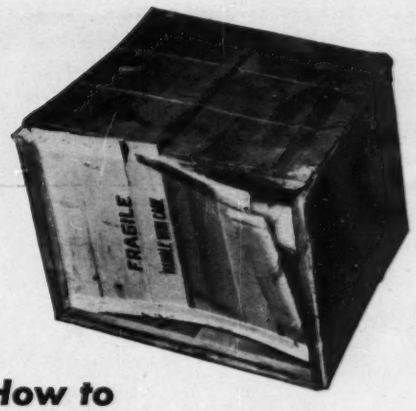
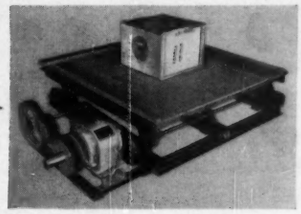



***How to***
**CUT LOSSES *due to***
**DAMAGE IN SHIPMENT**

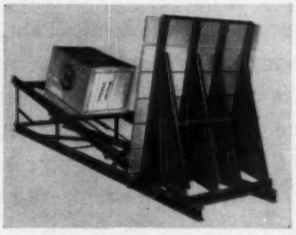
You can cut shipping losses to the very minimum by pre-testing your packages with L.A.B. Package Testers. The L.A.B. Vibration Tester, for example, can be set for a wide variety of motions to duplicate freight car and motor truck vibrations and shocks. The effect of, say, 1000 miles of transportation hazards can often be determined in less than an hour of testing.



L.A.B. Vibration Testers range from 400 lb. to 10,000 lb. capacity with table sizes up to 8 ft. by 12 ft.

**Saves Package Costs**

Use of L.A.B. Package Testers permits you to develop the most economical type of package which will do the required job. In many cases, users have redesigned their packages on the basis of accurate test data, with the result that the new packages are both stronger and less costly than the originals.



L.A.B. Incline-Impact (Conbur) Testers are available in capacities from 400 lb. to 10,000 lb.

**Reveals Product Weaknesses**

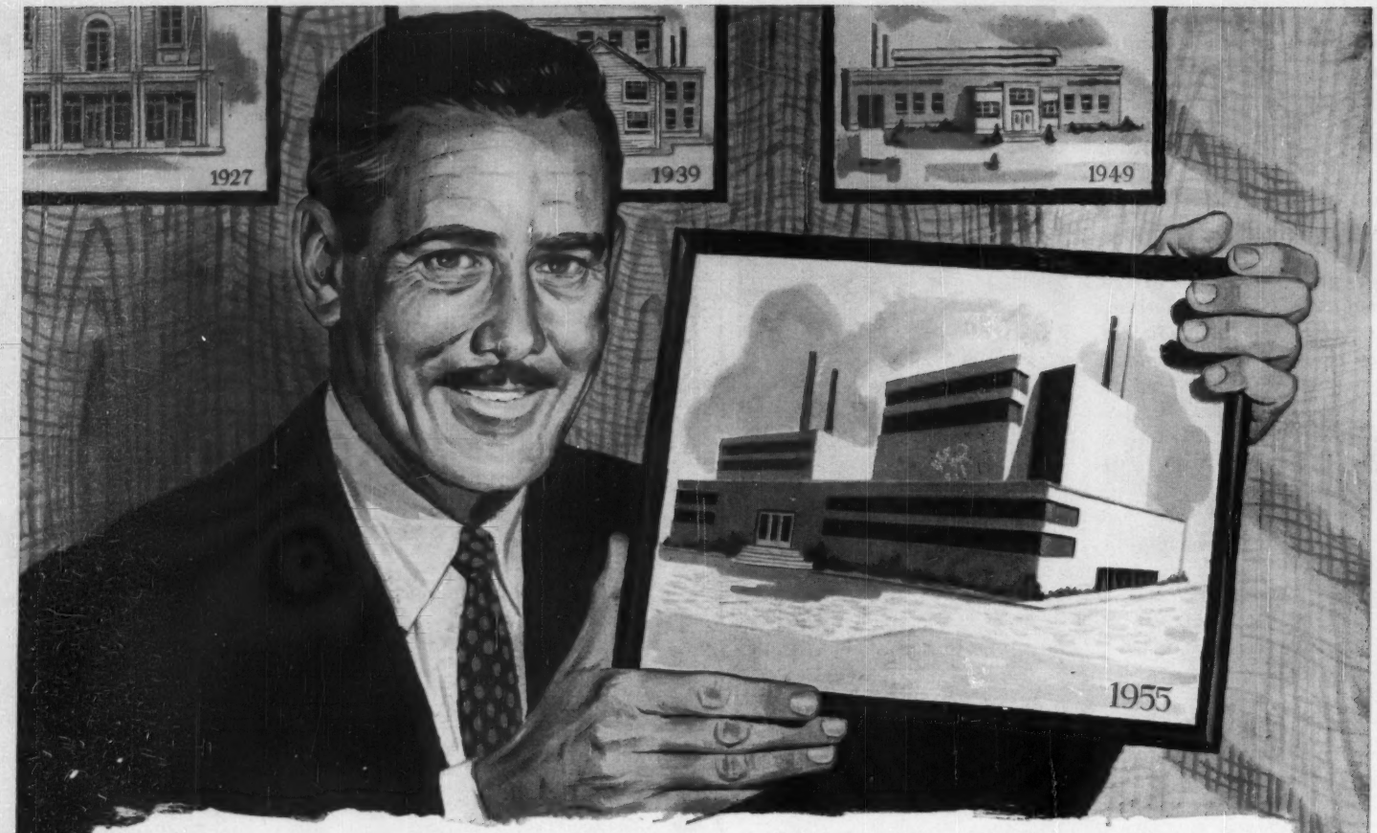
Often, unsuspected weaknesses in the product itself, as well as in the package, are revealed by L.A.B. Package Testers. By observation during test, the *initial* cause of failure is accurately determined. Test shipments, on the other hand, often reveal only the total damage — not the initial cause.

L.A.B. package testing equipment was instrumental in developing the test procedures recommended by the National Safe Transit Committee and the American Society for Testing Materials. L.A.B. equipment, now in use by leading manufacturers and the armed services, meets all the requirements of these procedures.

***For full information, write for catalog***

**L. A. B. Corporation**

**P.O. Box 279 Skaneateles, N.Y. Phone 1161**




# "....and the cornerstone is *Credit*...."

. . . said the new president of the Fanlay* Manufacturing Company at the dedication of the new building. "This is our 57th year in business and our success is due to the fact that we've kept our products ahead of the market and that our sales and credit team have kept ahead of the competition.

"My grandfather and father always recognized the power of credit, and we have grown with it from a local enterprise to a national distributor. The credit executive in our business is on the management team, and he is part of all sales planning programs. The more competitive a situation becomes, the more important is the credit function. We are always on the lookout for customer replacements, and are especially aware of the marginal account with the promise of progress in its product and management."

* * *

This is the actual story of a growing concern which has wisely used the power of credit to build a business. In today's competitive selling market, when every sale counts, when distributorships are being re-examined, when new markets and new products are being explored, thousands of business concerns are turning to Dun & Bradstreet for current information as a basis for sound credit, sales, and management decisions.

*Name fictionalized for advertising purposes.

**Dun & Bradstreet, Inc.**

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SPEED LOADING . . .
REDUCE COSTS
with MILWAUKEE
MAGNESIUM
Dock boards for truck or rail

JOB-ENGINEERED
Design, size and capacity to fit your needs.

SERIES F
Full length position lock, 60 models, to 3000 lbs. capacity.

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Low-cost Hand Truck Special. 24 models, to 2000 lbs. capacity.

*Let MPM representatives recommend a cost-saving answer to your loading problems, with job-engineered or standard dockboards.*

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*DESIGNERS and FABRICATORS for INDUSTRY, COMMERCE and GOVERNMENT*

Protect your inactive business records with proper storage. LIBERTY STORAGE BOXES are constructed of highest test corrugated fibre-board. Dust-proof, spill-proof protection. Liberty's storage system assures *fast-finding* of any record. Try LIBERTY BOXES for quality and low cost. 25 stock sizes. *Sold by leading stationers.*

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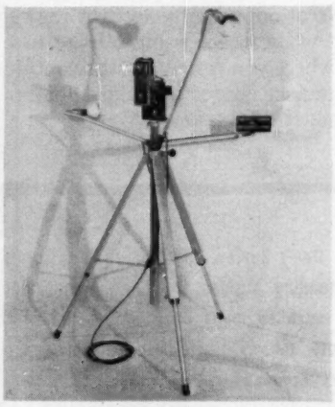
720 S. Dearborn Street • Chicago 5, Ill.

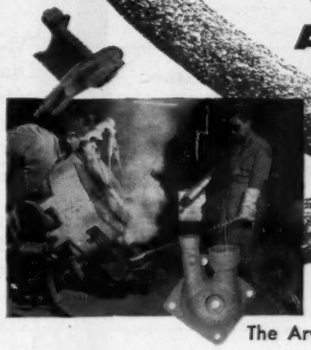
radioisotopes for research and medical use.") to *Weekly Earnings of Workers;* lists free publications sources of documents for sale. British Information Services, 30 Rockefeller Plaza, New York 20. (Other offices: Chicago, Los Angeles, San Francisco, Washington, D.C.)

***New products*** by the handful are coming from Curtiss-Wright Corporation's Electronics Division, Wood-Ridge, N.J. Since the start of the year, it's announced three types of ultrasonic equipment (a machine tool, a parts-washing unit, and a laboratory generator), two lightweight radiation detectors, a radiation scaler-ratemeter, and a beta-ray thickness gage. (For information on ultrasonic and radioisotope equipment and its applications, see October 1953, page 48; December 1954, page 68; and January 1955, page 36). The C-W ultrasonic equipment is of a new type—based on German designs—and each of the others offers some features not found in previously-available units. In addition to all of these, the company is offering industrial television equipment, an electronic colorimeter, and black light (ultraviolet units. It's a group of products well worth investigation.



***Identification photographs*** in a minute, says Fairchild Camera and Instrument Corp., Robbins Lane, Syosset, L.I., N. Y., referring to its new Polaroid "print-a-minute" camera, Model F-301. Incorporating a stereo attachment and a two-position over-the-center shift mechanism, the Fairchild ID camera will take four images on a 3¼ by 4¼-inch print. The "package," including camera, mounting and lighting system, and focus positioning bar, is designed for portability.

**the ARWOOD PRECISION CASTING CORP.**
**uses**
**Stenafax®**
ELECTRONIC COPYING EQUIPMENT
**in a systems operation to speed incoming orders through various departments**
**in MINIMUM TIME**
**at MINIMUM COST**
**with facsimile**
**ACCURACY**



The Arwood Precision Casting Corporation — nationally known manufacturers of investment castings, purchased STENAFAX because of the versatility of this modern facsimile copying machine in reproducing from all types of copy, including orders written in pencil or ink, typed or produced by mimeograph, offset or the hectograph process. While the mimeograph electronic cutting of stencils is their primary use, for their systems application Arwood also uses Stenafax to produce direct positive dry single copies at minimum cost.

As a result of this STENAFAX installation, Arwood is able to speed their inter-departmental paperwork and provide all personnel concerned with accurate facsimile copies of the customer's requirements — thereby rendering even more efficient service to their customers.

**Low cost OFFSET MASTERS are also produced by**

**Stenafax®**
**Division of Times Facsimile Corporation**
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**Simple to Operate**
**Versatile • Clean**
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**No Chemicals Ever**

# GOT A GUN FOR GAME LIKE THIS?

**This year do you plan to bag any "Highflying Bigwheels" of Industry and Business?**

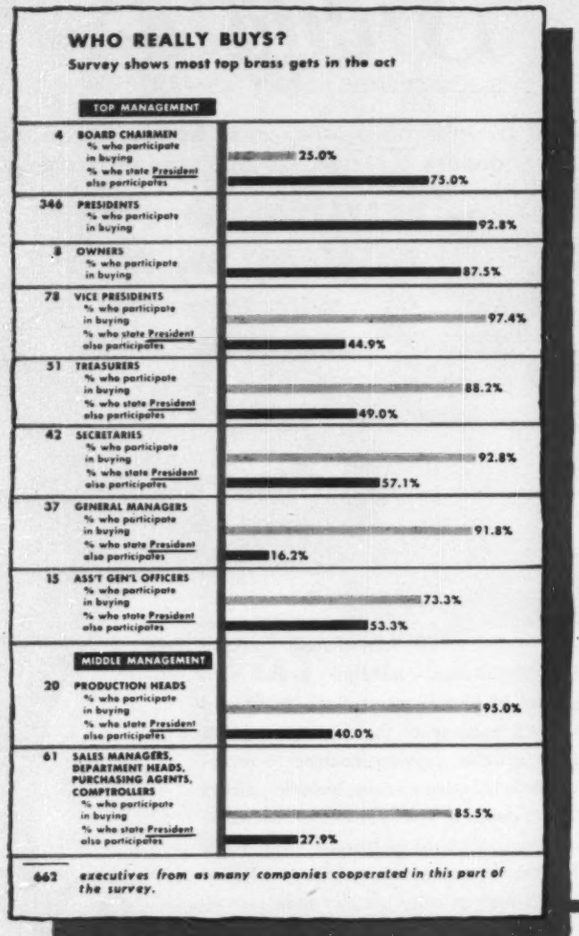
WHO REALLY BUYS?
Survey shows most top brass gets in the act
TOP MANAGEMENT
4 BOARD CHAIRMEN
% who participate in buying 25.0%
% who state President also participates 75.0%
346 PRESIDENTS
% who participate in buying 92.8%
8 OWNERS
% who participate in buying 87.5%
78 VICE PRESIDENTS
% who participate in buying 97.4%
% who state President also participates 44.9%
51 TREASURERS
% who participate in buying 88.2%
% who state President also participates 49.0%
42 SECRETARIES
% who participate in buying 92.8%
% who state President also participates 57.1%
37 GENERAL MANAGERS
% who participate in buying 91.8%
% who state President also participates 16.2%
15 ASS'T GEN'L OFFICERS
% who participate in buying 73.3%
% who state President also participates 53.3%
MIDDLE MANAGEMENT
20 PRODUCTION HEADS
% who participate in buying 95.0%
% who state President also participates 40.0%
61 SALES MANAGERS, DEPARTMENT HEADS, PURCHASING AGENTS, COMPTROLLERS
% who participate in buying 85.5%
% who state President also participates 27.9%
662 executives from as many companies cooperated in this part of the survey.

Chart from "Who Will Buy What Industrial Products in 1955?" (December issue). 766 manufacturing companies told their buying plans already budgeted and under active consideration. They covered 77 classifications. Take just one important item: 42% of the companies are to undertake building expansion. Think of the magnificence of this sales opportunity—tailormade, perhaps for you!

**How does this buying-authority lineup check with your selling strategy for 1955? Have you planned to earn the right to be considered where it counts most?**

**Isn't this pattern of buying-authority (*see chart*) pretty close to what exists within your own company? Doesn't it present the big selling problem to firms seeking to do business with your own organization?**

**How can you successfully meet your similar basic sales problem if you neglect to seek a solution and act on it?**

When you consider that 70.8% of the circulation of Dun's Review and Modern Industry is in the names of leadership-level men from general manager up, you can understand why we keep reminding you: When top management decides, everybody acts! Plant your ideas at the top—the roots will reach way down.

Dun's Review and Modern Industry provides you with an unequalled opportunity to address the calibre of men who control and direct the activities responsible for about 80% of any industry's volume. And this is your shortest route to the "center of authority" in major business enterprises, including 41,514 of the nation's best manufacturing plants.

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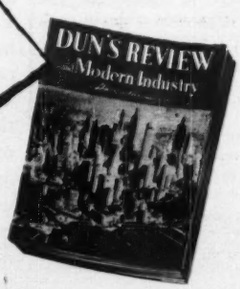


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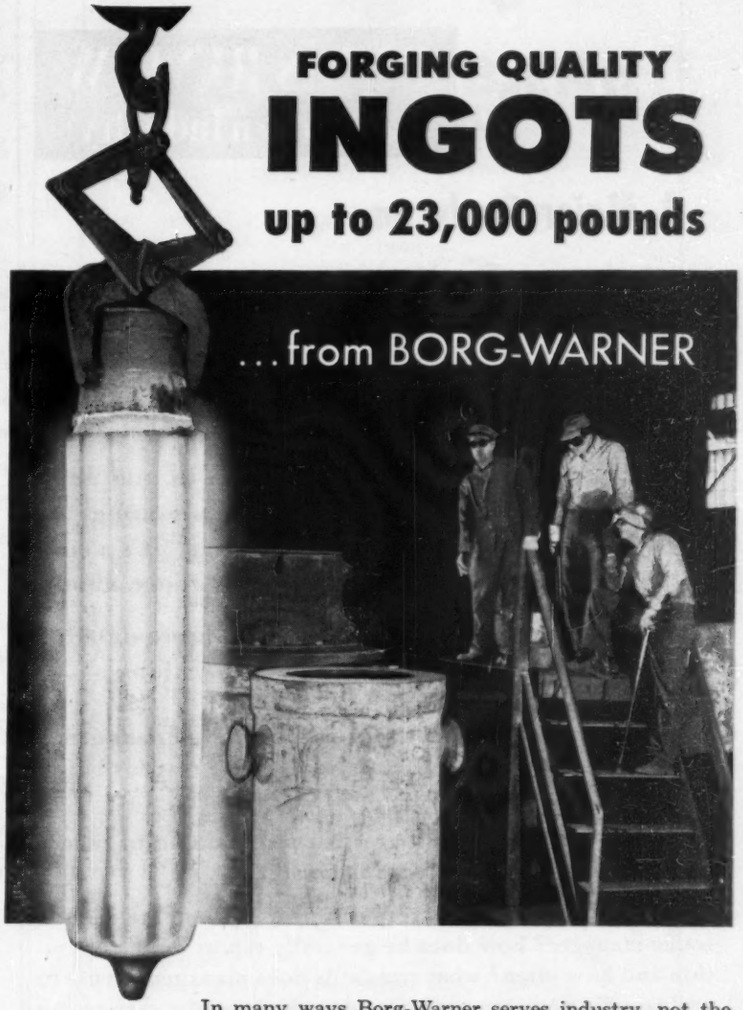


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- what should you know about your transportation pattern? about ways to reduce costs? delegating responsibility? keeping accurate records?
- what are the most progressive plants doing to reduce costs? expedite emergency shipments?
- what's the breadth of responsibility given to the general traffic manager? how does he generally report on his operation and how often? what standards does management use to evaluate his performance? how does he keep the carriers on their toes? how does he work with them for faster, damage-free deliveries? what costs are generally considered transportation costs?
- how does better packaging cut costs?
- what are common, expensive shipping errors and how can they be prevented?
- what small tips can save most companies hundreds of dollars on their transportation costs?
- what's ahead in transportation?

**All management men will find this study informative and packed with ideas. Be sure you read it next month.**

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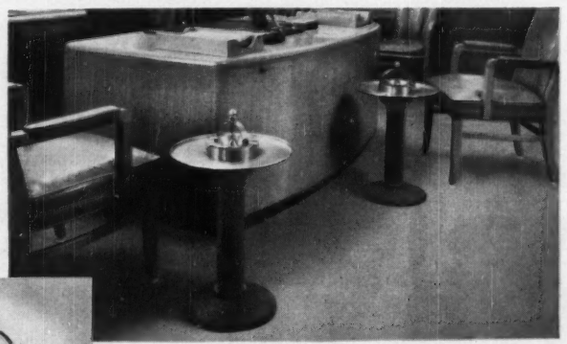

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## *Condensed Annual Statement*
**as on 30th November, 1954**

### ASSETS

| | |
|---|---|
| Cash on hand and due from banks (including items in transit) | $ 467,429,065 |
| Government of Canada and provincial government securities, not exceeding market value | 969,888,546 |
| Municipal and other securities, not exceeding market value | 288,188,034 |
| Call loans, fully secured | 156,395,203 |
| Total quick assets | $1,881,900,848 |
| Other loans and discounts | 1,031,626,844 |
| Mortgages and hypothecs insured under the N.H.A. (1954) | 22,672,390 |
| Bank premises | 24,194,181 |
| Liabilities of customers under acceptances, guarantees and letters of credit | 59,349,565 |
| Other assets | 7,152,016 |
| | $3,026,895,844 |

### LIABILITIES

| | |
|---|---|
| Deposits | $2,797,548,149 |
| Acceptances, guarantees and letters of credit | 59,349,565 |
| Other liabilities | 23,064,466 |
| Total liabilities to the public | $2,879,962,180 |
| Capital paid up | 41,809,863 |
| Rest Account | 103,619,726 |
| Undivided profits | 1,504,075 |
| | $3,026,895,844 |

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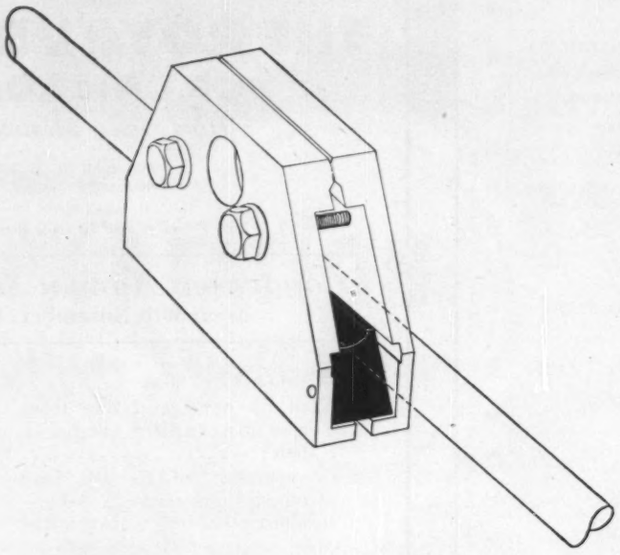

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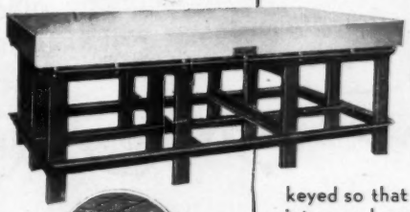
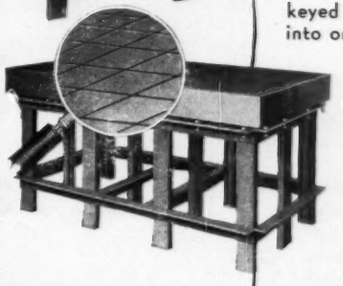
IN A COMPLETE LINE OF PRECISION EQUIPMENT

Industrially proved in automotive, aviation and other metal working plants, Challenge Precision Equipment has demonstrated its ability to withstand severe wear and still retain *accuracy*. Shown below are a few results of Challenge precision craftsmanship. The complete line is described in the new Challenge catalog available on request.



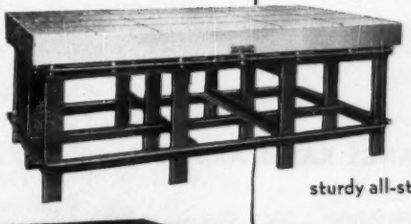
LAYOUT SURFACE PLATES

Made of special analysis semi-steel, Challenge Layout Surface Plates are precision ground or planer finished. Standard sizes range from 12 x18 inches to 54x144 inches. Plates can be grooved and keyed so that two or more can be assembled into one huge unit of unlimited size.



LAPPING PLATES

Assures a perfect fit when lapping metal-to-metal-joints on which no sealer of any kind is used. Ideal for preventing oil leaks in crank cases, cylinder heads, end bells, gear housings, etc. Plates have 1/16 inch grooves, 1/2 inch apart, running the full length and width of the surface.



WELDING TABLES

Provides a smooth, accurate, semi-steel surface with "Tee-Slots" for assembly, locating and welding. Available in 3 standard sizes: 30x60 in., 48 x96 in. and 54x144 in.- other sizes to order. Table includes sturdy all-steel stand with leveling screws.

WORK BENCHES Durable cast-iron top two inches thick. Leveling screws insure a perfectly level surface. Three styles . . . Four sizes (top dimension) 28x48 and 28x60 with four legs; 28 x72 and 28x84 with six legs.

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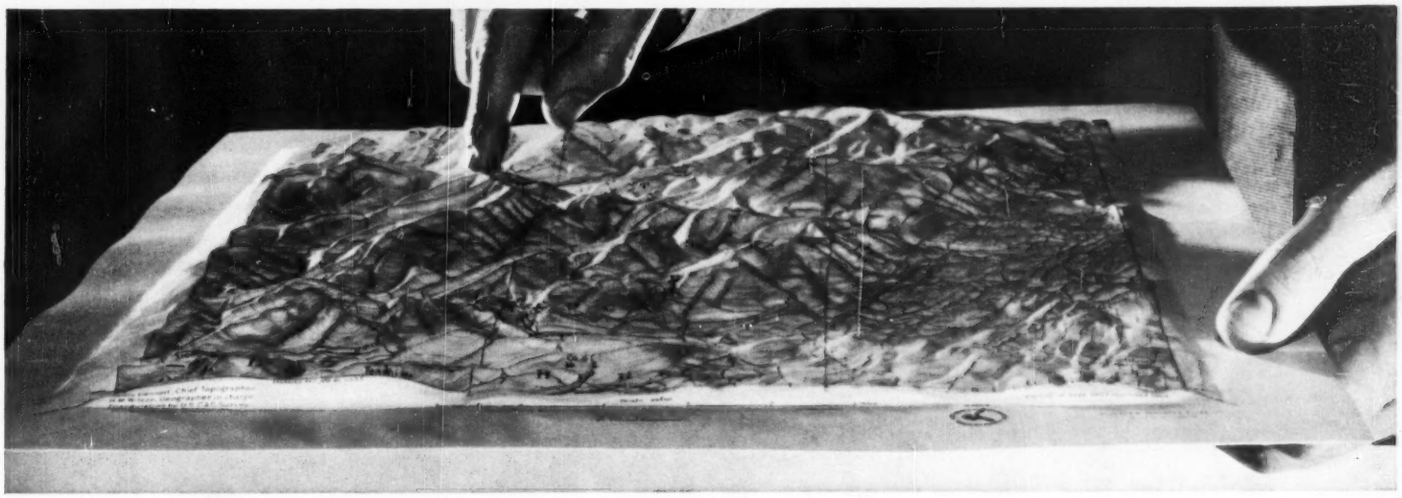
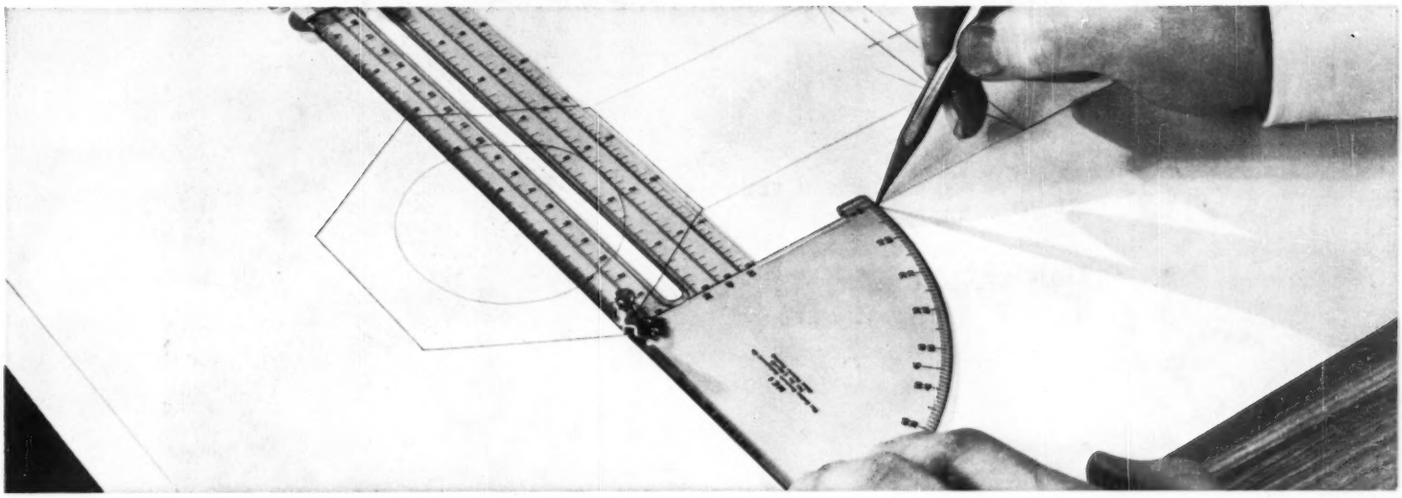


# FOR CONTOURS LIKE THESE...



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Molded contour map made by **Aero Service Corp.**, Philadelphia 20, Pa.
Drawing instruments by **Graphic Calculator Company**, Chicago 5, Ill. for Golden Precision Instrument Co., Denver, Ind.

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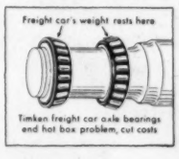
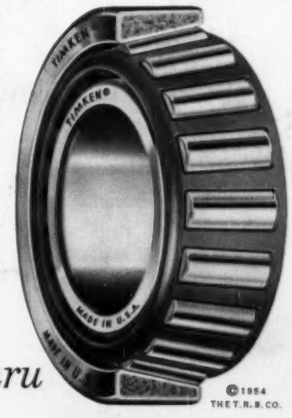
Timken bearings are designed and manufactured for true rolling motion. And to get steel good enough, we make our own. We're the only U.S. bearing maker that does. The Timken Roller Bearing Company, Canton 6, Ohio. Cable address: "TIMROSCO".

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